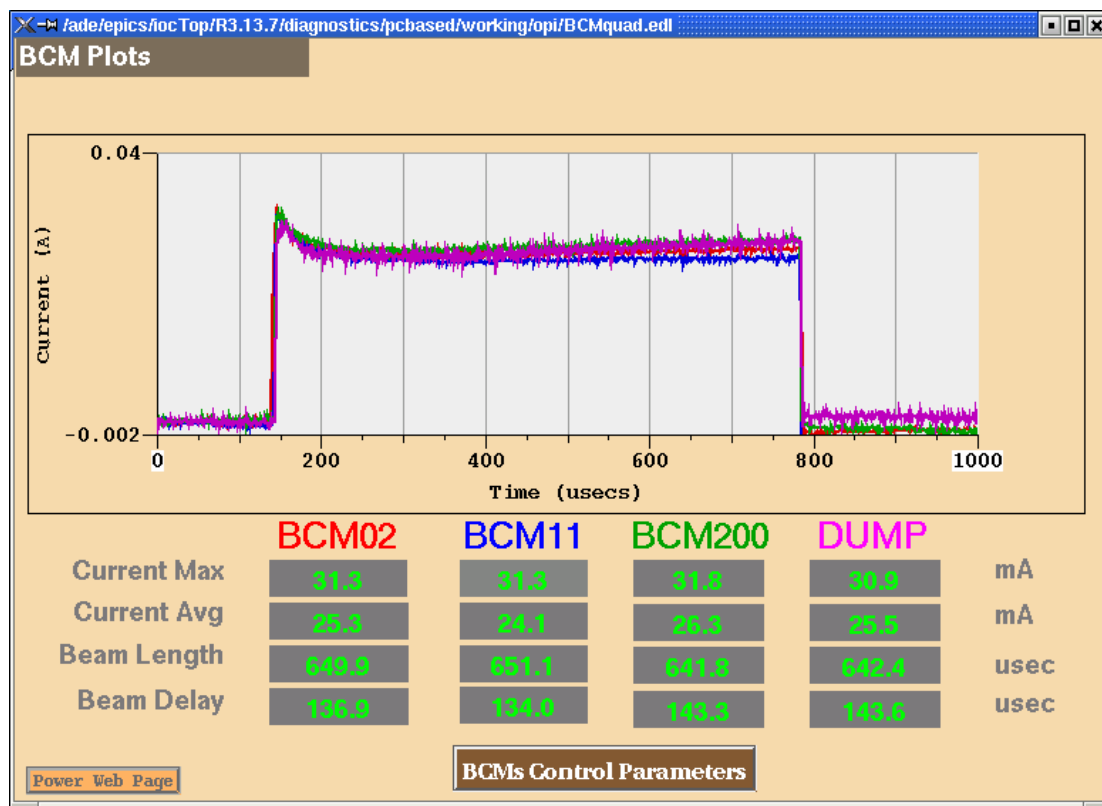


The Spallation Neutron Source Monthly Report

October 2003



A U.S. Department of Energy Multilaboratory Project

SPALLATION NEUTRON SOURCE
Argonne National Laboratory • Brookhaven National Laboratory • Lawrence Berkeley National Laboratory • Los Alamos National Laboratory • Oak Ridge National Laboratory • Thomas Jefferson National Accelerator Facility





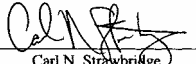
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Target Hot Cell ceiling

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


 Carl N. Strawbridge
 SNS Deputy Project Director
 12/4/03
 Date

Highlights:

- Good project performance continues with minor cumulative schedule and cost variances against the March 2006 early finish schedule. Through the end of October 2003, 73.1% of the project is complete. Completion percentages are:
 - ◊ 97 % of R&D
 - ◊ 93 % of design
 - ◊ 67 % of technical hardware (including procurement and fabrication)
 - ◊ 76 % of conventional construction
 - ◊ 42 % of installation
- The available contingency balance of \$44.8M will be reduced to \$31.3M once the changes identified in the Estimate at Completion are incorporated into the baseline.
- Excellent safety performance continues. As of October 25, 2003, the Project has worked in excess of 2.6 million hours with 44 recordable injuries (an increase of one since the last report) and no lost work day (away) cases. No environmental concerns have been noted.
- The semi-annual DOE SC review was held in the beginning of November. The review team commented on the excellent progress thus far and reaffirmed confidence in the project team. Continued diligence in the management of contingency and identification of cost saving opportunities were recommended.

Assessment and Issues:

Accelerator Systems Division (ASD): The commissioning of DTL tank #1 was completed with a very successful high power run. In particular, a time averaged beam of 1.0 mA was accelerated to 7.5 MeV. This beam, accelerated to 1.0 GeV, would correspond to a beam power of 1.0 MW! This demonstrates the high-beam-current capability of the hardware and is the last very high power run until SNS has beam on the mercury target. Halo and scraping studies were also completed, demonstrating that a more round beam in the HEBT significantly reduced halo. The HVCM for the RFQ and DTL #1 worked reliably. Seventeen drift tubes (DT's) (out of a total of 27) have been installed in DTL #4. The DTL #5 tank has been leak tested and is leak tight. The first 15 DT's for DTL #5 (of a total of 23) have been fiducialized, magnet mapped, and leak tested. Cooling manifold installation has begun. Tank #6 vacuum seals are being prepped. The first RF module of the CCL has been shipped to ORNL and plans have been made to reassemble the module in the linac tunnel. The installation of the RF system for CCL #1 has been completed and that for medium beta cryomodules #1, 2, 3 and 4 is nearing completion. The factory acceptance test for the 805-MHz 5.0-MW SN 1 klystron is complete and the tube has been shipped to ORNL. A total of 31 of 81 Niobium cavities have been qualified at JLAB; since the JLAB Cavity Review, seven cavities have been successfully qualified. Cryomodule #5 has been tested, meets specifications, and will be shipped to ORNL. The two halo collimators have been installed in the HEBT tunnel along with their iron shielding. The first 21Q40 quadrupole was measured and installed in the HEBT tunnel. Ring cabling installation continues to go well and all heavy cabling to the arcs has been completed. Approximately two miles of heavy cable are pulled per week.

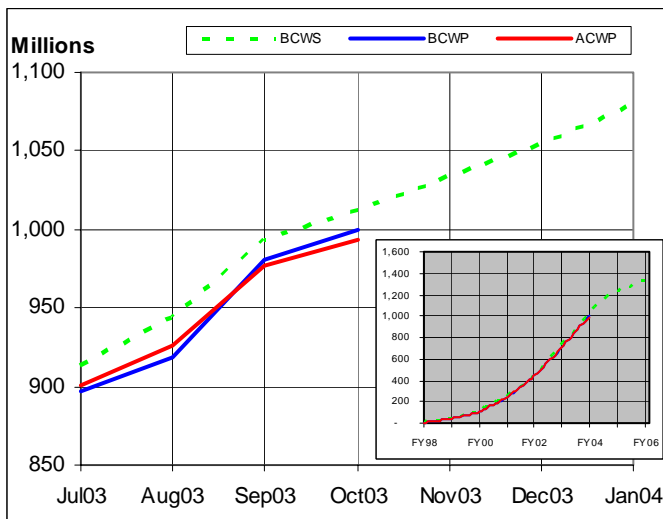
Experimental Systems Division (XFD): Installation of the Target monolith continues on schedule. The drain pipe has been welded and pressure testing of the core vessel completed. The first nine interstitial blocks have been delivered and the four pedestal manipulator base plates have been placed above the monolith as part of the first high bay

floor concrete placement. The bids for the inner plug assembly have been received and are being evaluated. On the instrument side, the detector team has been given the chance to test their linear position sensitive detectors in Time of Flight mode at the accelerator front end. Neutron spectra were recorded at several positions, and both the prompt pulse and a delayed tail associated with partially-thermalized neutrons were observed. Instrument procurement actions are proceeding well and a vendor has been selected for the liquids reflectometer sample table.

Conventional Facilities (CF): Storm drains are being installed in the area of the north Ellipse Road near the RTBT truck entrance. This will prevent future flooding problems in the Ring and RTBT tunnels. Installation of the liner over the final section of the Ring and RTBT tunnel sections has restarted and is proceeding east toward the east Make Up Air (MUA) building. Piping, ductwork, plumbing, electrical and masonry work continues in the Target Building with the bulk of work still occurring in the basement, on the instrument floor and in the 2TU building. Concrete has been placed around the monolith at the high bay level. A portion of the hot cell ceiling is being formed for a series of concrete placements. The problem of surface voids in the concrete has been resolved and they are being chipped out and repaired with heavy weight grout. Repairs of the mercury pan have been identified and are being pursued. The CLO building construction continues with mechanical, electrical and plumbing work ongoing at various locations throughout the building. Installation of the siding on the south side of the building has begun and the contractor is accelerating his work to allow an early date for dry-in. The foundations for the Target/CLO pedestrian bridge have been located and the modified bridge design has been turned over to the contractor for a proposal. The boilers in the CUB are now operational and hot water, chilled water and power are fully available as required by ASD for installation and commissioning.



Project Overview and Assessment (con't)



Total Project	Oct03	Cum-to-Date
BCWS	18,886	1,012,895
BCWP	18,437	999,620
ACWP	17,047	993,716
CV	1,390	5,904
SV	-449	-13,275
CPI	1.08	1.01
SPI	0.98	0.99
Budget at Complete		1,366,913
Contingency		44,788
Total Project Cost		1,411,701

Total Project Cost (TPC)	\$1,411.7 M
Percent planned (cumulative)	74.1%
Percent complete (cumulative)	73.1%
Total Estimated Cost (TEC)	\$1,192.7 M
Cost and Commitments through 10/31/03	\$944.2M
Outstanding Phase Funded Awards	\$68.3M
Budget to Complete	\$203.8M
Contingency	\$44.8M
Estimate at Completion	\$1,161.4M
Remaining Contingency Based on EAC (~20%)	\$31.3M

Critical Path:

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

While no single area in the Target Systems shows negative or zero days float, the Target Module Plug and the Hot Cell construction both show approximately one month positive float. However, for the Target Module Plug, this is a loss of 20 days of float from last month. Completion of the Target Module specification, required for bidding fabrication of the plug, has caused this one month slip.

Construction of the Hot Cell remains critical with 20 days of positive float, unchanged from last month. Availability of the Hot Cell drives loading of target Mercury and conducting integrated startup testing of the target systems and the Target Readiness Assessment.

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



Linac Systems– Los Alamos National Lab



CCL Module 2

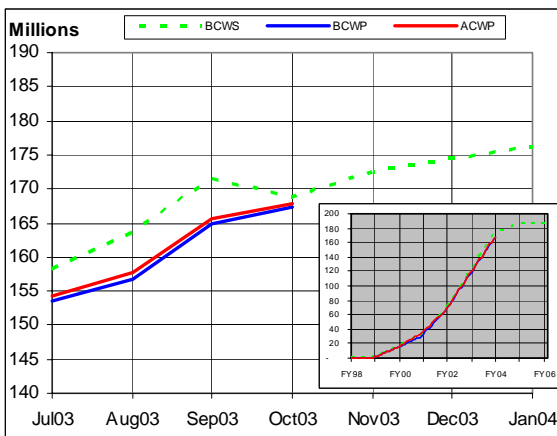
Highlights:

- All first article components for the 5-MW RF system (klystron, circulator, load) for the Coupled Cavity Linac (CCL) have passed LANL site acceptance tests at the full SNS specification and have been shipped to ORNL. An agreement has been reached with *Thales* that compensates for a reduction of the 5-MW klystron specifications. However, the *Thales* 550-kW SCL klystrons are still problematical, even after the reduction in specifications. SN 7 passed factory acceptance tests but was later damaged in packing by a *Thales* technician and will need to be reworked. Four more *CPI* SCL klystrons (S/Ns 35-38) have been shipped to ORNL.
- Testing of the final circulator marked completion of the site acceptance testing of the 2.5-MW RF system for the Drift Tube Linac.
- Both the prototype and production HVCMs at LANL operated to power two HPRF test stands during October. The pulse-width-modulation test data on a HVCM system at ORNL have been analyzed and a trap network assembly has been detailed that will be used to minimize output ripple. Work has begun on start-pulse configurations to minimize back diode oscillations, core flux offset, and IGBT start currents for the SCL modulators.
- Despite some new problems that arose in the manufacturing of drift tubes for the DTL, the drift tubes continue to be shipped to ORNL to support installation in Tanks 4, 5, and 6.
- Module-level tuning of CCL Module-1 has been completed at the vendor and it has been received at ORNL. While progress on CCL Module-2 is encouraging, the required January delivery date is still of concern and the schedule for the remaining modules continues to be closely managed.
- Completion of diagnostics deliverables continues on schedule. The remaining DTL BPMs were mapped as part of the final drift-tube cleaning and inspection process, and all look good. The software on the Digital Front Ends is being upgraded in preparation for changing the operating system on the BPM electronics. All DTL and CCL wire-scanner electronics and PCs were shipped and received at ORNL.

Assessment/ Issues:

The key concern at this time is the CCL module delivery schedule. Close vendor oversight will be continued.

Performance and Milestones:



	Oct03	Cum-to-Date
BCWS	-2,573	168,874
BCWP	2,684	167,460
ACWP	2,314	167,873
CV	370	-413
SV	5,257	-1,414
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CPI	1.16	1.00
SPI	-1.04	0.99
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Budget at Complete		186,253
<hr/>		
Planned % Complete		90.7%
Actual % Complete		89.9%

Cost Performance:

Cause and Impact: None required
Corrective Action: None required

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

Schedule Performance :

Cause and Impact: The current period variances are due to incorporation of the 1.4.1 HPRF ETC which was implemented in October to properly rephase the RF work and baseline the turnover of work from LANL to ORNL by the end of March 2004.

Corrective Action: Continued vendor liaison will be performed to ensure the schedule and quality of deliverables is maintained.



Highlights:

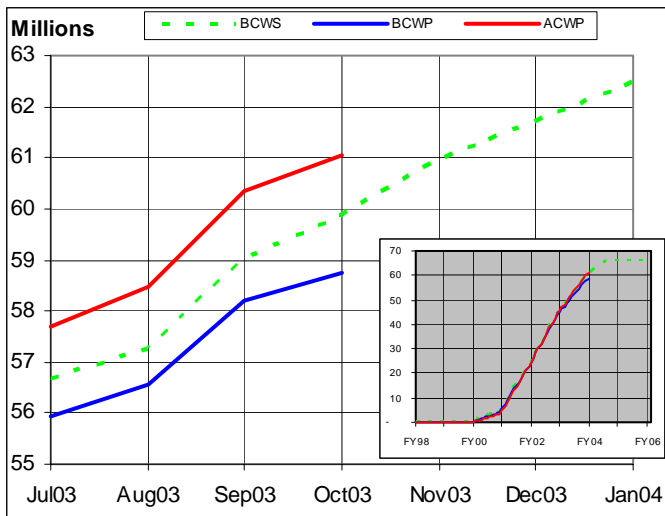
- Shipment and installation of SNS cryomodule M-3 in the tunnel was completed.
- Assembly of cryomodule M-6 was completed and assembly of cryomodule M-7 has begun.
- Testing of cryomodule M-5 is continuing.
- In the first two weeks of November, a total of five medium-β cavities have been qualified under the new procedures. There have been no failures. Most had higher thresholds for the onset of field emission, accelerating gradients at $Q_0 = 5 \times 10^9$ of 15 MV/m or higher, and all had significantly lower radiation output. Enough cavities are now qualified to assemble cavity strings for M-8 and M-9.

Assembly of the cavity string for M-8 is complete and the string is under vacuum.

Assessment/ Issues:

Good progress has been made in reducing the number of cavity retests since incorporation of new processes and procedures.

Performance and Milestones:



	Oct03	Cum-to-Date
BCWS	883	59,897
BCWP	551	58,748
ACWP	716	61,047
CV	-165	-2,299
SV	-333	-1,149
CPI		
	0.77	0.96
SPI		
	0.62	0.98
Budget at Complete		
		66,044
Planned % Complete		
		90.7%
Actual % Complete		
		89.0%

Cost Performance:

Cause and Impact: The cumulative cost variance is a result of the additional effort required in the Medium Beta cavity qualification.

Corrective Action: Implementation of the new procedures appears to be having a positive effect. An ETC will be performed in the Spring of 2004 once a specific course of action (incorporating the results of the review and the test program) has been finalized.

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: The cumulative unfavorable schedule variance results from the difficulty in maintaining a consistent cavity qualification process.

Corrective Action: See above corrective action.



HEBT Collimators installed

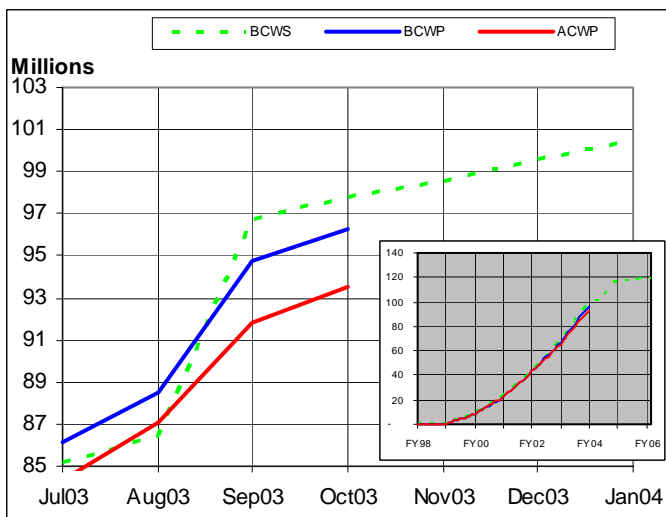
Highlights:

- The first Ring RF system including the RF cavity, power amplifier and a set of power supplies, has been delivered to ORNL.
- The large field errors (sextupole component) measured in 30-cm ID quadrupoles were attributed mostly to the misalignment of magnet coil. Modeling by the AP group confirmed the measurement findings. These undesired components were successfully reduced by shimming with G10 inserts.
- The first of 8 ring doublet assemblies and the first of 4 ring quarter-cell assemblies were successfully test-assembled.
- Magnet measurement of a 41-cm ID ring correctors (41CDM30) indicated an abnormal harmonics component. Later verification showed a wiring defect made by the vendor. Two repairs have been made at the vendor.
- Magnetic measurement of the ring injection chicane dipole #3 was completed and agreement with computer calculations is satisfactory. This dipole is intended to compensate for the tapering effect on the circulating beam from chicane dipole #2, designed for the collection of stripped electrons at injection.
- The accelerator physics group continues to evaluate several schemes of magnet sorting to optimize the performance of the ring magnets. Schemes based on resonance elimination were shown to effectively diminish the impact of magnet nonlinear imperfections.
- The extraction kicker Pulse-Forming-Networks were successfully tested at the vendor.
- The lattice location of the HEBT momentum collimator has been finalized and installation drawings are being circulated for the final review and sign-off.

Assessment/Issues:

No issues to report.

Performance and Milestones:



	Oct03	Cum-to-Date
BCWS	1,022	97,794
BCWP	1,448	96,246
ACWP	1,730	93,570
CV	-282	2,675
SV	426	-1,548
CPI		
	0.84	1.03
SPI		
	1.42	0.98
Budget at Complete		
		118,504
Planned % Complete		
		82.5%
Actual % Complete		
		81.2%

Cost Performance :

Cause and Impact: The positive cost variance is the cumulative effect of a decrease in BNL's procurement burden. The PCR that has been implemented to compensate for the lower actual costs being incurred will gradually deplete this positive variance.

Corrective Action: None required

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

Schedule Performance :

Cause and Impact: The schedule variance is largely due to a lag in the processing of accounting documentation for receipt of the HEBT low field power supplies. The remainder of the variance is due to delays in the HEBT collimator scrapers. The latter does not impact any installation activities.

Corrective Action: None required



Core Vessel Installation

Highlights:

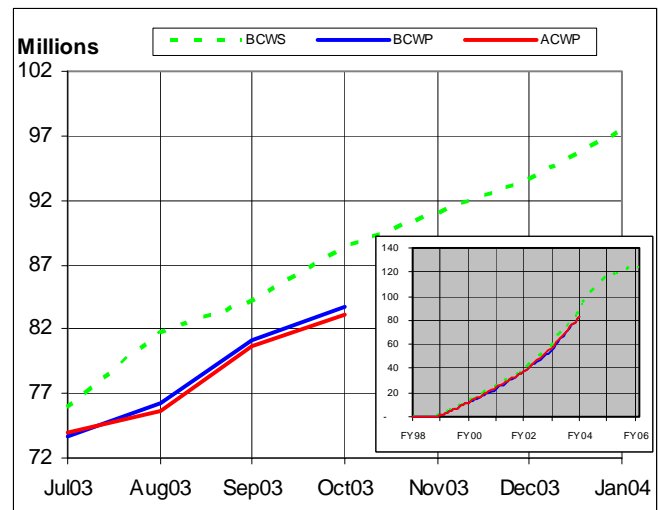
- Installation Package 1 has been completed and Installation Package 2 of the monolith equipment installation has begun. Installation of the lower section of core vessel onto the inner support cylinder has been completed, satisfying a major project and UT-Battelle milestone.
- The cryogenic system cold box that houses a large Helium heat exchanger, various valves, and an expansion turbine, is in place.
- The large inflatable seal for the target module has been successfully tested by the vendor.
- The lead formwork shells for the Target and Beam Dump Utilities first article IX Column and Filter Housing were completed and lead has been poured into the formwork shells. The first article IX column will be used in testing the handling and transport cart that will be used by Operations.
- The Target and Beam Dump Utilities Gas Panel and the Target Protection System procurements have been awarded.
- Factory testing of the four servomanipulator arms was successfully completed. Two will be fitted into the hot cell servomanipulator bridge system and two will be mounted on the pedestal manipulator.
- The complete set of radiation resistant video cameras has been received at the vendor and the hot cell video system fabrication is now ready for factory testing.

Assessment/ Issues:

- Target building construction schedule and target systems installation schedule continue to be integrated/optimized to minimize schedule/cost issues.

Performance and Milestones:

	Oct03	Cum-to-Date
BCWS	4,161	88,401
BCWP	2,615	83,762
ACWP	2,508	83,179
CV	106	583
SV	-1,547	-4,639
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CPI	1.04	1.01
SPI	0.63	0.95
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Budget at Complete		124,682
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Planned % Complete		70.9%
Actual % Complete		67.2%



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

Cost Performance:

Cause and Impact: None required
Corrective Action: None required

Schedule Performance:

Cause and Impact: The cumulative schedule variance is due to delays in delivery of interstitial blocks and slow crane/telemannipulator progress at the vendor.
Corrective Action: These delays do not impact project completion as this particular work does not comprise the project's longest path.



Instrument Systems– Argonne and Oak Ridge National Labs



Neutron guide stands for the Backscattering Spectrometer

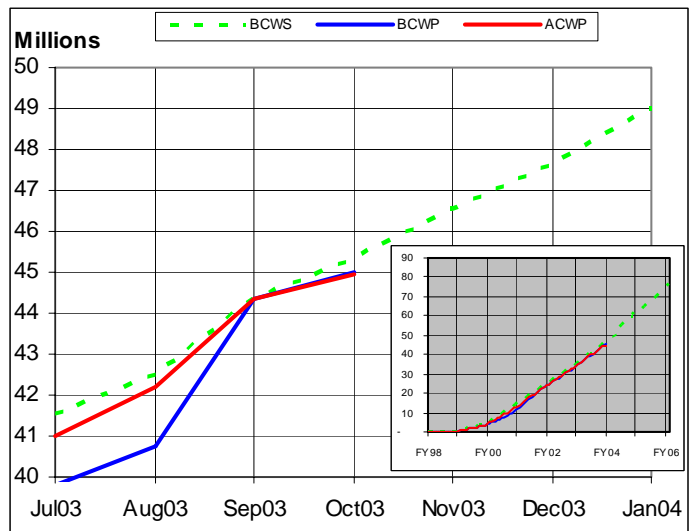
Highlights:

- The mounting support to be used with the Astrium bandwidth limiting choppers went out for bid.
- The Neutron Scattering Software Initiative (NeSSI) workshop was held at SNS October 13-15, 2003 to assess user requirements for an integrated data analysis and visualization system for SNS.
- A customized cryofurnace was received as part of the SNS sample environment effort. This cryofurnace will be commissioned in collaboration with HFIR and initially operated at HFIR where it will be used to evaluate designs of SNS heat shields and other structures.
- Work on the personnel protection systems for the instruments has begun.
- Meetings with the vendor for the goniometer/sample stage for the magnetism reflectometer covered the design and dimensions of components and subcomponents of incident/detector arm and sample stage.
- Final acceptance testing of the first 2 Astrium bandwidth choppers for the magnetism reflectometer has been completed.
- The remaining two 20cm x 20cm 2-dimensional detectors from Brookhaven National Laboratory have been received.

Assessment/ Issues: No issues at this time.

Performance and Milestones:

	Oct03	Cum-to-Date
BCWS	982	45,344
BCWP	659	45,021
ACWP	606	44,968
CV	53	53
SV	-323	-323
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CPI	1.09	1.00
SPI	0.67	0.99
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Budget at Complete		80,036
<hr/>		
Planned % Complete		56.7%
Actual % Complete		56.3%



Cost Performance:

Cause and Impact: None required
Corrective Action: None required

Schedule Performance:

Cause and Impact: The current period schedule variance is due to delays in design effort that were largely caused by lost time due to personnel moves to Oak Ridge. The remainder was caused by one improperly phased procurement activity that is spread from October 2003-May 2004 and should have been planned only for May 2004.
Corrective Action: A PCR will be completed to correct the procurement activity.

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



Conventional Facilities– Oak Ridge National Lab



Top of the Target Monolith

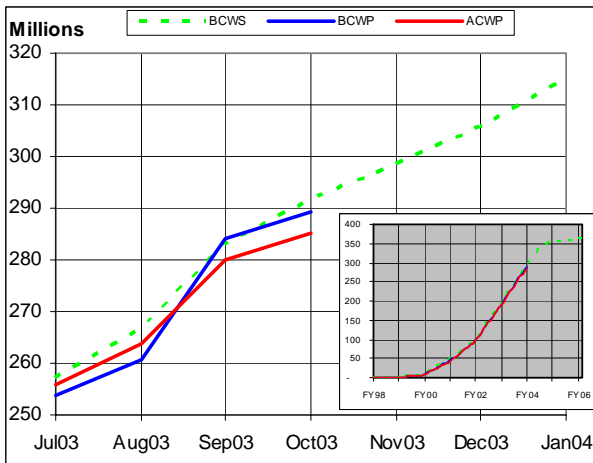
Highlights:

- ASD received BOD of the RTBT Service Building.
- Construction of the East and West Makeup Air Buildings and the Ring Injection Dump continues.
- Phase III of the final land improvements work, the RTBT Tunnel backfill & liner installation is underway. Installation of storm drain pipes at the North Ellipse Road and the east and west CLO parking lots has begun.
- Installation of the Hot Cell liner pan is in progress. All construction trades are progressing in the basement level and south side instrument level areas of the Target Building.
- Structural steel erection is substantially complete with punch list items ongoing for the CLO General Construction effort. Fireproofing continues as well as piping, electrical conduit, cable tray and stud wall installation. Siding, roofing and glass installation is also underway.
- Testing and labeling of fiber optic cable continues and installation of the fiber optic backbone to the Ring Service Building has begun.
- The Fire Alarm System is being installed in the CLO.

Assessment/ Issues:

The Target Hot Cell Ready For Equipment (RFE) date is currently forecasted for April 12, 2004, a critical date to ensure completion of target installation efforts. The CLO is currently forecasted to be complete 7 October 2004. However, project staff currently located off-site will move into portions of the CLO in June 2004.

Performance and Milestones:



	Oct03	Cum-to-Date
BCWS	8,679	291,686
BCWP	5,238	289,224
ACWP	5,383	285,304
CV	-146	3,920
SV	-3,441	-2,462
CPI	0.97	1.01
SPI	0.60	0.99
Budget at Complete		367,540
Planned % Complete		79.4%
Actual % Complete		78.7%

Cost Performance:

Cause and Impact: The positive cumulative cost variance is due to the inclusion and stauting of contract mods in the baseline. Actual costs have not yet been incurred for these activities even though the work is completed. Accruals will be placed against these mods as soon as all the procurement work required has been completed.

Corrective Action: None required

Schedule Performance:

Cause and Impact: The negative schedule variance is the result of behind schedule progress for the Target Crane, Target General Construction and CLO General Construction.

Corrective Action: None required

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



Integrated Control Systems– Oak Ridge National Lab



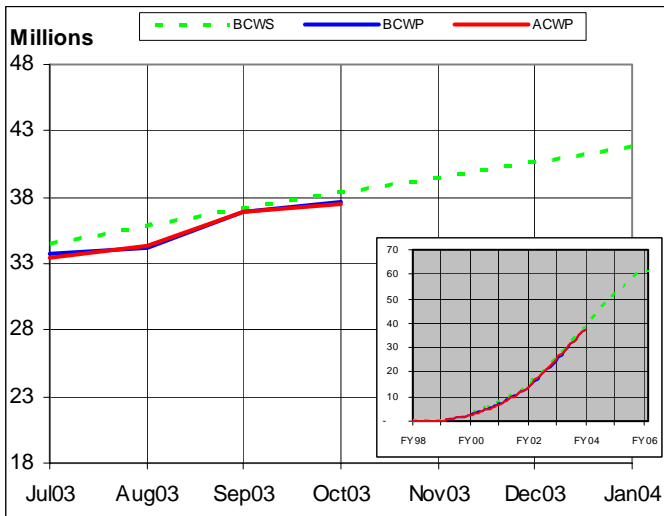
Controls cable trays

Highlights:

- Analysis of why the Input-Output Controllers stopped communicating during the DTL-1/D-Plate run consumed much of the month and included the help and interest of EP-ICS collaborators during the ICALEPCS meeting in Korea. Some issues were resolved and a relatively stable system was available when the run resumed. Analysis of remaining issues continues.
- The Cryogenic Control System is now on-line, supporting around-the-clock operation of the Central Helium Liquefier Purifier System. Since the facility is not manned around the clock, an automatic phone dialer was installed and tested. Selected Purifier System alarms have been configured to activate the dialer and notify CHL operations personnel that a problem exists. The Control System is being used to support clean-up of the main warm compressors. The ability to dynamically change the control loop process variable has helped automate this activity. Checkout and calibration of most of the sensors and actuators on 4 of the 6 Central Helium Liquefier main compressor skids was completed in October.
- The field device installation, conduit and cabling for the CHL Oxygen Deficiency Hazard (ODH) system in the warm compressor area is 90% complete. Cabling in this area has been tested to verify the cabling and functionality of the field devices. The field device and conduit installation in the cold box area is also 90% complete.
- Fabrication of controls racks for the Ring and RTBT Service Buildings was completed. This completes all rack fabrication except for a modification that will be needed to support the collimator cooling water skids in the ring tunnels.
- Installation of the Linac segment of the Personnel Protection System (PPS) continues.

Assessment/Issues: No issues at this time.

Performance and Milestones:



	Oct03	Cum-to-Date
BCWS	1,321	38,461
BCWP	805	37,667
ACWP	697	37,544
CV	108	123
SV	-516	-794
CPI	1.16	1.00
SPI	0.61	0.98
Budget at Complete		61,337
Planned % Complete		62.7%
Actual % Complete		61.4%

Cost Performance:

Cause and Impact: None required
Corrective Action: None required

Schedule Performance:

Cause and Impact: None required
Corrective Action: None required

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



Installed cryomodules 1,2 and 3

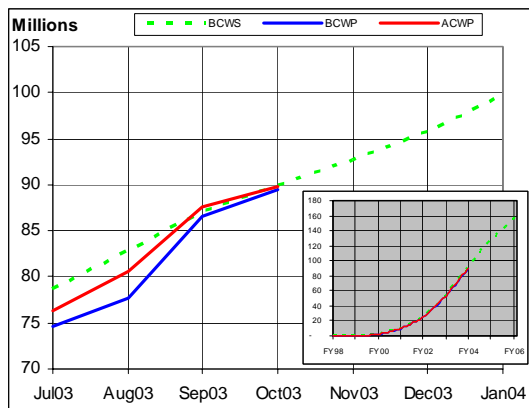
Highlights:

- DTL Tank #1 Commissioning is complete and the resulting measured beam quality is very positive: the transmission is 100% within measurement uncertainty; the RMS transverse emittance core is 0.2 pi-mm-mrad; the RMS transverse emittance with tails is 0.3-pi mm-mrad compared to a requirement of 0.3-pi; and the bunch length is ~25 degrees RF.
- On October 3, 2003, the RFQ cavity changed resonant frequency to 402.0 MHz, 0.5MHz lower than the nominal 402.5 MHz. Significant deviations from a flat distribution and two power loops exhibiting unusually high reflected power were also found. The RFQ was returned back to its nominal frequency.
- The first 805-MHz side-coupled CCL copper structure has been successfully frequency tuned at ACCEL Germany. This was a joint effort between LANL, ORNL and ACCEL.
- The third medium-beta cryomodule has been delivered to ORNL and placed in the tunnel.
- Repair of the 1-MW 805-MHz JLAB RF test stand has been completed and testing of components has resumed.
- HEBT and Ring installation, including cabling, continues to go well.
- The move of the technology groups from the RATS building to trailers and laboratories on the SNS site has been completed, allowing ASD to vacate the RATS building and its lease.

Assessment/ Issues:

Deliveries of CCL and DTL components are being closely monitored to determine potential impacts on installation and commissioning activities.

Performance and Milestones:



	Oct03	Cum-to-Date
BCWS	2,856	89,939
BCWP	2,897	89,422
ACWP	2,294	89,808
CV	602	-386
SV	41	-517
CPI		
	1.26	1.00
SPI		
	1.01	0.99
Budget at Complete		168,660
Planned % Complete		53.3%
Actual % Complete		53.0%

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

Cost Performance:

Cause and Impact: None required
Corrective Action: None required

Schedule Performance:

Cause and Impact: None required
Corrective Action: None required



CLO construction

Highlights:

- Site erosion control measures continue to be monitored and maintained. The repair to the slope by the Bethel Valley Access Road was completed without major erosion and has been reseeded. The effectiveness of the repair and the reseeded will be routinely evaluated.
- Revisions to the Target Safety Analysis continue, with authors assigned and deadlines established. The updated document will be delivered to DOE before the end of the calendar year.
- A meeting was held with the DOE individual responsible for the SNS water permits. It was agreed that the condensate from all SNS air handling units, except those in the basement of the Target building, can be disposed of in either the ORNL sanitary sewer system or the SNS storm drains. Each air handling unit will be evaluated to determine which system should receive the condensate. This decision represents a significant operational savings as well as enhanced flexibility for future facility modifications.
- The air permit for the SNS Central Exhaust Stack has been finalized, and is being routed from the Tennessee Department of Environment and Conservation (TDEC). Permits for the boilers in the CLO are currently under development by the TDEC, and are expected in the near future.

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

External Review Data:

Progress on External Review Recommendations in the month of October is as follows:

Review	Recommendations	Closed This Month	Open Actions
DOE End Game Review (7/03)	5	2	2
DOE SC Review (5/03)	29	20	5
DOE SC Review (11/02)	35	1	1

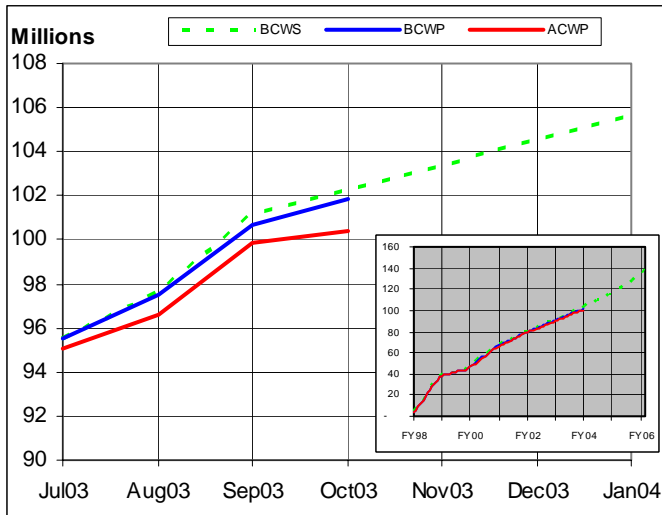
Life of Project Market Experience:

Major Awards (\$M)	Baseline Estimate (\$M)	Baseline Savings (\$M)	Percent savings over baseline
529.7	523.5	-32.5	-6.5%

Through November 18, 2003: 95% of the major procurements already awarded.



Performance:



	Oct03	Cum-to-Date
BCWS	1,217	102,318
BCWP	1,203	101,888
ACWP	576	100,398
CV	627	1,490
SV	-13	-430
CPI		
	2.09	1.01
SPI		
	0.99	1.00
BAC (1.1.13&1.2)		114,621
BAC (1.10.3&1.10.5)		32,110
Planned % Complete		69.7%
Actual % Complete		69.4%

Cost Performance Cum to Date:

Cause and Impact: None required
Corrective Action: None required

Schedule Performance Cum to Date:

Cause and Impact: None required
Corrective Action: None required

Milestones:

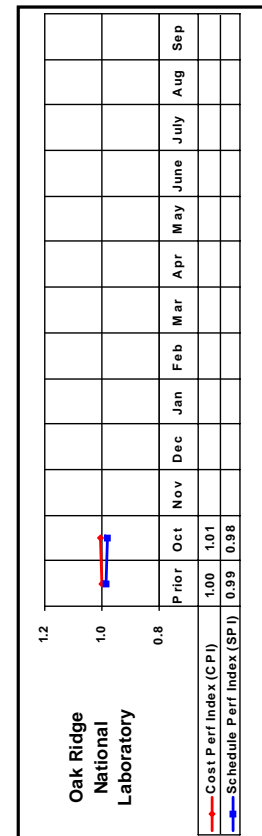
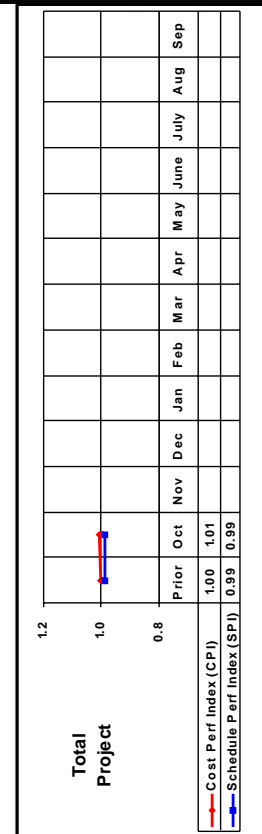
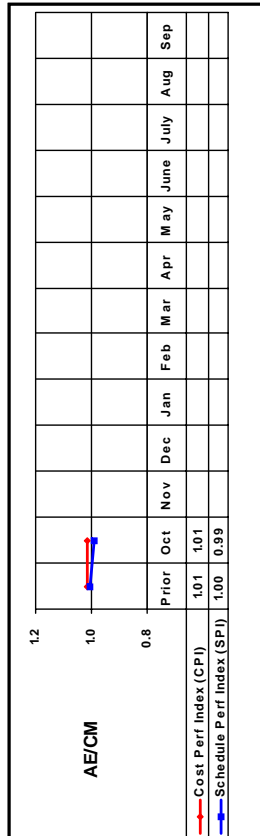
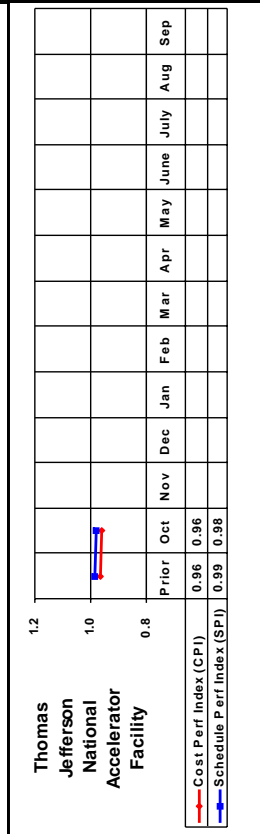
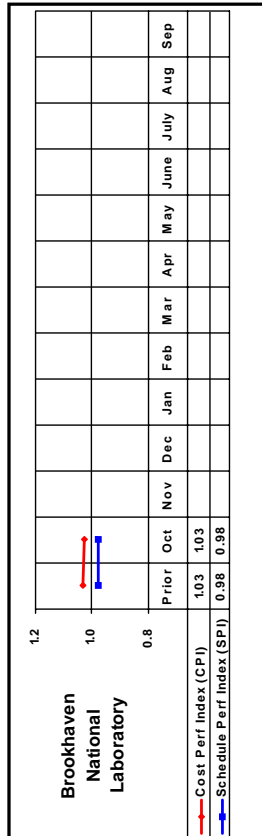
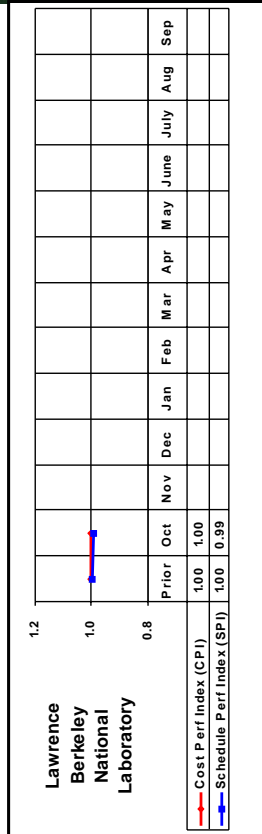
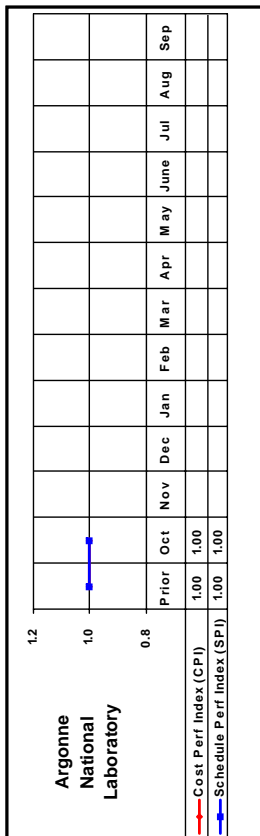
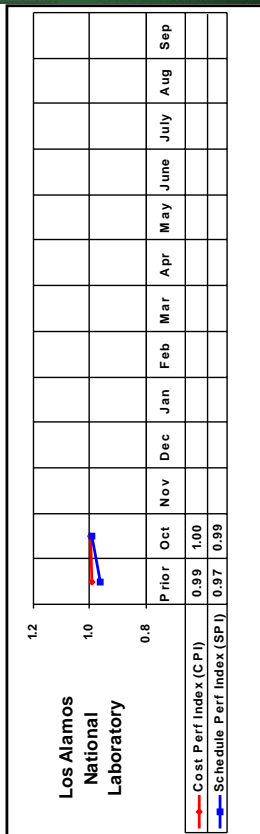
Description	Milestone Date	Forecast Date
EIS ROD	Jun-99	Jun-99 ✓
PSAR Issued for Approval	Dec-99	Dec-99 ✓
Submit PSAR to DOE for Approval	Dec-99	Dec-99 ✓
PSAD issued for Information	Sep-00	Sep-00 ✓
Issue FSAD for approval (Front End and Linac)	Sep-02	Aug-02 ✓
Issue FSAD for approval (Ring and Transfer 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

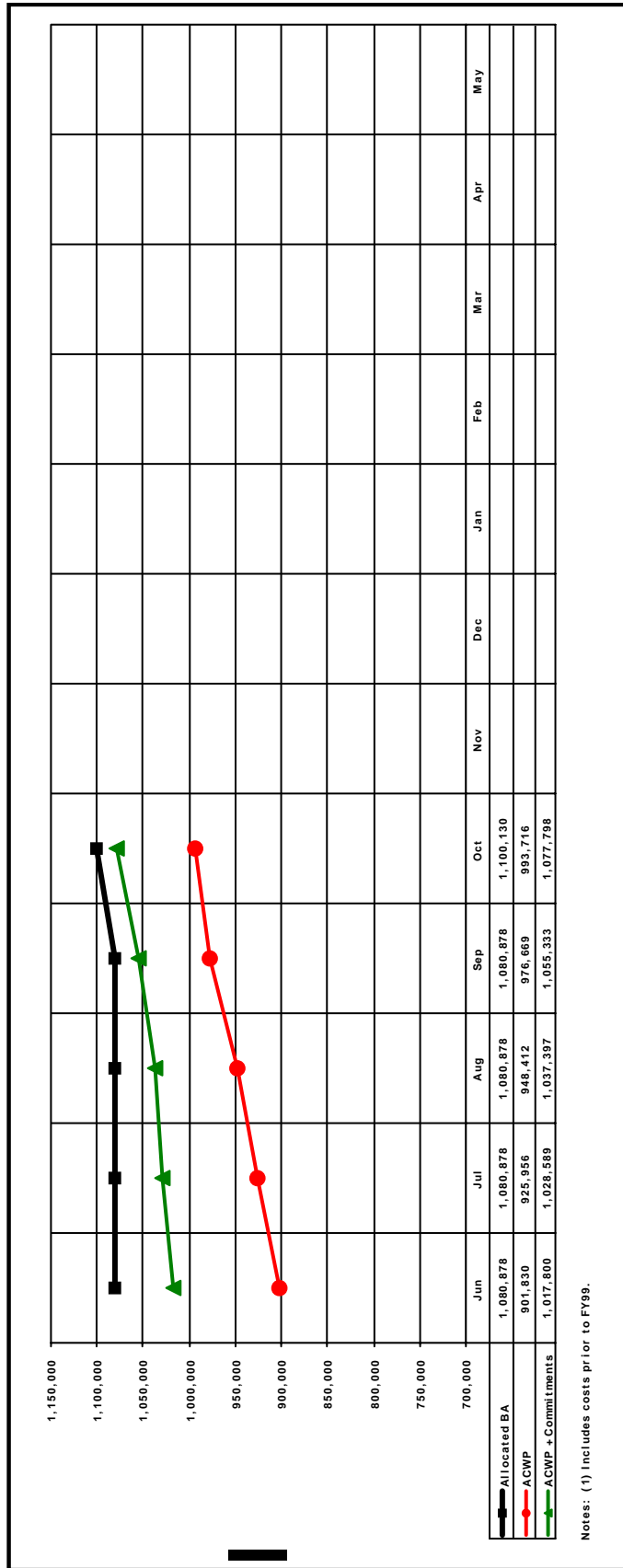




Overall Project Performance is stable



Obligation Profile against BA



Notes: (1) Includes costs prior to FY99.

Phase funded procurements at the end of October could obligate an additional \$68.3M, raising the total obligation potential to \$1,146M



PROJECT TITLE:	REPORTING PERIOD:										PROJECT NUMBER:							
	October 01, 2003 through October 31, 2003										99-E-334							
	BCWS PLAN DATE: October 2003										START DATE: October 1998							
PARTICIPANT NAME AND ADDRESS:										COMPLETION DATE: June 2006								
Oak Ridge National Laboratory Oak Ridge, TN																		
ITEM	CURRENT PERIOD						CUMULATIVE TO DATE						AT COMPLETION					
	BUDGETED COST		ACTUAL COST		VARIANCE		BUDGETED COST		ACTUAL COST		VARIANCE		BUDGET (BAC)	ESTIMATE (EAC)	VARIANCE			
	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	SCHED	COST	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	SCHED	COST						
1.02 Project Support	774.1	774.1	504.2	504.2	0.0	269.9	59,857.8	59,857.8	58,974.7	58,974.7	0.0	883.2	75,603	75,863	-260			
1.03 Front End Systems	0.0	0.0	43.2	43.2	0.0	(43.2)	20,832.0	20,832.0	20,798.7	20,798.7	0.0	33.3	20,832	20,832	0			
1.04 Linac Systems	(125.7)	4,579.0	4,275.0	4,704.7	304.1	304.1	262,304.2	258,968.8	262,270.4	262,270.4	(3,334.4)	(3,300.7)	313,212	314,597	-1,385			
1.05 Ring & Transfer System	1,471.6	2,158.4	2,142.5	686.8	15.9	105,554.7	104,260.8	101,574.7	101,574.7	101,574.7	(1,293.9)	2,686.1	141,245	142,140	-895			
1.06 Target Systems	4,161.3	2,614.6	2,508.1	(1,546.7)	106.5	70,245.8	65,607.3	65,023.8	65,023.8	65,023.8	(4,638.6)	583.5	106,528	108,108	-1,580			
1.07 Instrument Systems	843.6	532.5	459.7	(311.1)	72.8	32,057.4	31,746.3	31,673.5	31,673.5	31,673.5	(311.1)	72.8	63,321	63,321	0			
1.08 Conventional Facilities	8,678.7	5,237.6	5,383.4	(3,441.1)	(145.8)	291,686.0	289,223.9	285,304.0	285,304.0	285,304.0	(2,462.1)	3,920.0	367,540	376,930	-9,390			
1.09 Integrated Control Systems	1,321.4	805.2	697.0	(516.2)	108.2	36,756.2	35,962.7	35,839.5	35,839.5	35,839.5	(793.5)	123.2	59,632	59,632	0			
LINE ITEM SUBTOTAL	17,125.0	16,701.4	16,013.1	(423.6)	688.4	879,294.1	868,460.6	861,459.3	861,459.3	861,459.3	(12,833.6)	5,001.4	1,147,913	1,161,423	-13,510			
CONTINGENCY													44,787	31,277	13,510			
TOTAL LINE ITEM	17,125.0	16,701.4	16,013.1	(423.6)	688.4	879,294.1	868,460.6	861,459.3	861,459.3	861,459.3	(12,833.6)	5,001.4	1,192,700	1,192,700	0			
1.01 Research & Development	138.1	126.5	146.4	(11.7)	(20.0)	98,445.4	98,433.6	98,527.4	98,527.4	98,527.4	(11.8)	(93.8)	101,874	101,874	0			
1.10 Operations	1,622.4	1,608.9	887.4	(13.5)	721.5	35,155.4	34,725.4	33,729.2	33,729.2	33,729.2	(430.0)	996.1	117,126	117,126	0			
OTHER PROJECT COSTS SUBTOTAL	1,760.5	1,735.4	1,033.8	(25.2)	701.5	133,600.8	133,159.0	132,256.6	132,256.6	132,256.6	(441.8)	902.3	219,000	219,000	0			
TOTAL PROJECT COST	18,885.5	18,436.8	17,046.9	(448.8)	1,389.9	1,012,894.9	999,619.6	993,715.9	993,715.9	993,715.9	(13,275.4)	5,903.7	1,411,700	1,411,700	0			
RECONCILIATION TO CONTRACT BUDGET BASE																		
DOLLARS EXPRESSED IN: Thousands																DATE: November 24, 2003		



PROJECT TITLE:	REPORTING PERIOD:										PROJECT NUMBER:		
	Spallation Neutron Source Project										99-E-334		
	October 01, 2003 through October 31, 2003										START DATE: October 1998		
PARTICIPANT NAME AND ADDRESS:	BCWS PLAN DATE:										COMPLETION DATE:		
	Oak Ridge National Laboratory Oak Ridge, TN										June 2006		
	October 2003										AT COMPLETION		
ITEM	CURRENT PERIOD				CUMULATIVE TO DATE				VARIANCE		ESTIMATE (EAC)	BUDGET	VARIANCE
	BUDGETED COST		ACTUAL COST		BUDGETED COST		ACTUAL COST		SCHED	COST			
	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF			
AE/C/MORN/L (1.8)	8,678.7	5,237.6	5,383.4	-3,441.2	-145.8	291,686.0	289,223.9	285,304.0	-2,462.1	3,920.0	367,540	376,930	(9,390)
Argonne National Laboratory	0.0	0.0	0.0	0.0	0.0	44,382.1	44,382.1	44,382.1	0.0	0.0	44,382	44,382	0
Brookhaven National Laboratory	1,281.6	1,512.4	1,737.0	230.8	-224.5	104,594.3	102,286.6	99,465.0	-2,307.6	2,821.6	128,710	128,905	(195)
Thomas Jefferson Laboratory	883.4	550.5	715.7	-332.8	-165.2	59,897.3	58,748.2	61,047.5	-1,149.1	-2,299.3	66,044	67,199	(1,155)
Los Alamos National Laboratory	-2,306.8	2,917.9	2,567.9	5,224.7	350.0	177,296.9	176,256.5	176,855.1	-1,040.4	-598.5	198,088	198,088	0
Lawrence Berkeley National Laboratory	69.2	18.1	58.7	-51.1	-40.6	28,330.6	28,177.0	28,081.1	-153.6	95.9	29,663	29,663	0
Oak Ridge National Laboratory	10,279.5	8,200.2	6,584.3	-2,079.3	1,616.0	306,707.8	300,545.2	298,581.1	-6.2	2.0	532,485	535,255	(2,770)
WBS SUBTOTAL	18,885.6	18,436.7	17,046.9	(448.9)	1,389.8	1,012,895.0	999,619.6	993,715.9	(7,119.0)	3,941.6	1,366,913	1,380,423	(13,510)
CONTINGENCY											44,787	31,277	13,510
TOTAL PROJECT COST	18,885.6	18,436.7	17,046.9	(448.9)	1,389.8	1,012,895.0	999,619.6	993,715.9	(7,119.0)	3,941.6	1,411,700	1,411,700	0
RECONCILIATION TO CONTRACT BUDGET BASE													
DOLLARS EXPRESSED IN: Thousands													
DATE: November 24, 2003													

Revision	PCR Number	Description	PCR Cost Impact (\$K)	Transfer Amount
R451	LI-04-002	Transfer Diagnostics Budget for APP Actuators	-	276
R452	LI-03-014	Implement results of LANL RF ETC	-	-
R453	LI-04-004	Revise DTL Cost and Schedule Baseline	150	-
R454	LI-04-005	Revise CCL Schedule Baseline	-	-
R455	LI-04-003	Implement 1.4:5.2 Diagnostics ETC	(150)	-
R456	IS-04-001	Properly Load Procurement Activities	-	-



PROJECT TITLE:	REPORTING PERIOD:		PROJECT NUMBER:													
	Spallation Neutron Source Project October 01, 2003 through October 31, 2003		99-E-334													
PARTICIPANT NAME AND ADDRESS:	BCWS PLAN DATE:		START DATE:													
	Oak Ridge National Laboratory Oak Ridge, TN		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	23,755	18,636	18,917	22,523	16,673	18,819	16,123	12,437	19,449	11,524	12,393	10,890	202,139	83,604	1,147,912
1.02 Project Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.03 Front End Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.04 Linac Systems	(6,100)	1,416	160	567	668	690	466	716	475	358	441	604	461	(460)	1	
1.05 Ring & Transfer System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.06 Target Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.07 Instrument Systems	(530)	(62)	(115)	(192)	78	166	76	(210)	(209)	(170)	(219)	58	(1,330)	1,330	-	
1.08 Conventional Facilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.09 Integrated Control Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL AUTHORIZED CHANGES		(6,630)	1,354	45	375	746	857	542	506	266	187	221	662	(869)	870	1
PM BASELINE (END OF PERIOD)	862,169	17,125	19,989	18,962	22,898	17,420	19,676	16,665	12,943	19,715	11,712	12,614	11,552	201,270	84,474	1,147,913
RECONCILIATION TO CONTRACT BUDGET BASE																
DOLLARS EXPRESSED IN: Thousands																
DATE: November 24, 2003																



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 expended.

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)—A realistic appraisal of the cost 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) — $TEC + OPC$