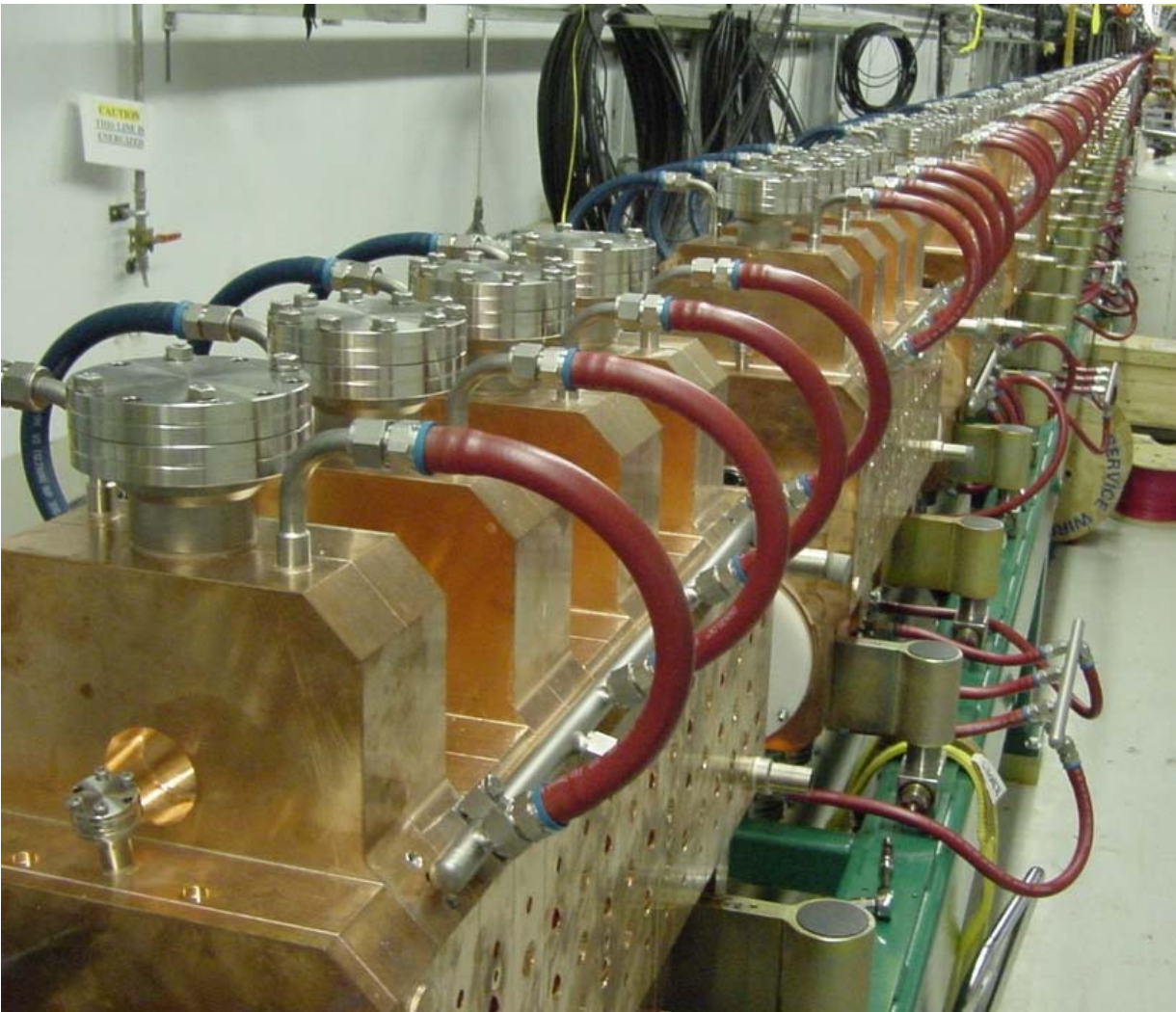


The Spallation Neutron Source Monthly Report

April 2004



A U.S. Department of Energy Multilaboratory Project

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





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Project Overview and Assessment



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

Carl N. Strawbridge
 SNS Deputy Project Director
 6/8/2004
 Date

SNS celebrates 3 million construction hours worked without a lost work day (away)

Highlights and Issues:

- Good project performance continues with minor cumulative cost and schedule variances of 0.7% and -8% respectively against the March 2006 early finish schedule. Through the end of April, 81.1% of the project is complete. Completion percentages are:
 - ◊ 99 % of R&D
 - ◊ 95 % of design
 - ◊ 77 % of technical hardware (including procurement and fabrication)
 - ◊ 89 % of conventional construction
 - ◊ 53 % of installation
- Contingency continues to be tight. The available contingency balance of \$28.2M will be reduced to \$25.3M once the changes identified in the Estimate at Completion are incorporated into the base-

line. Approximately \$5M of undistributed pre-operations budget is also available.

- Excellent safety performance continues. Through 25 April 2004, the total Project has worked in excess of 5.1 million hours with 63 recordable injuries (an increase of 2 from last month) and no lost work day (away) cases.
- Management focus continues on executing/managing the critical path work of target installation and preparing the cryo plant for operation.
- Due to FY04 BA constraints, work priorities are being closely managed. Some selected slow-downs could be directed if necessary.
- The Defense Contract Management Agency reviewed the SNS Earned Value Management System with a very impressive result- no corrective actions, 3 suggested improvements and 3 best practices.
- The semi-annual DOE review was held in May. In general, the review team was pleased with the excellent progress since the last review; there were no action items.

Assessment:

Accelerator Systems Division (ASD): Don Richied, Cryo Group Leader, suddenly and tragically died of a heart attack May 21, following shoulder surgery. The group is operating under a six week plan for Don's absence for his surgery and ASD is working on a fast way to provide cryo leadership into commissioning and operations. All DTLs and CCLs have been installed in the tunnel giving 302 feet of warm copper linac. All the DTLs have been tuned. CCL1 has been RF conditioned above the operating voltage level. CCL2 and CCL3 are tuned and under vacuum. The warm linac installation is on track for September beam commissioning. 120 of 125 HPM boards have been received to date. More than 50% of these have been tested and calibrated. All 125 FCM motherboards have been received. A detailed plan to get ready for the 4.5K cold box run in July is being prepared. The first 4.5K cold box run revealed several issues that will be resolved in the July run. CHL commissioning is ASD highest priority. The Injection straight section mock-up is being assembled at BNL. A second set of quad doublets has been included in the overall assembly. Vacuum chambers for the dump septum and chicane #4 are in the BNL Shops for minor rework. Chambers for chicane #2 and 3 should be ready for a trial fit next week with the thin foil chain drive mechanism. Twenty eight of 32 Ring arc half cells have been delivered in Oak Ridge and numbers 29, 30 and 31 are being assembled in BNL.

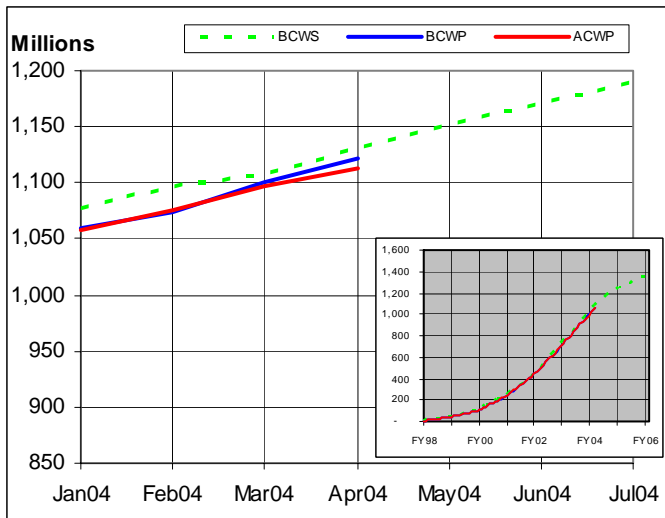
Experimental Systems Division (XFD): Installation and equipment delivery continues at a fast pace for Target Systems. The fifth upper interstitial block (a total of twenty are required) as well as the steel components for the shutter plugs were delivered. The fabrication and vendor testing of the mercury storage tank is complete. The final data package has been reviewed and approved, and the vendor has been instructed to ship the vessel. The heat exchanger vendor needs to procure new tubes, causing a one-month delay. The affect of the late delivery on installation package is being investigated to see if a work-around can be developed. Final installation of the hot cell bridge system rails has begun as well as fabrication of the hot cell penetration flanges at the vendor. Painting of the exterior surfaces of the bulk shield liner was completed and bulk shield block installation around the proton beam win-

dow enclosure continues. The Backscattering Spectrometer final flight path was evacuated Friday, May 14, 2004 for the first time. It achieved a pressure of < 10 mTorr upon first pump down in a total pumping time of approximately 1 hr 40 min. This performance exceeds the technical specification of 10 mTorr in under three hours of pumping time. An evaluation of the performance of different polarized devices for the Magnetism Reflectometer has begun and the draft Research Safety Summary for the liquids reflectometer was completed. Performance studies of the Reflectometer detector systems at the Californium Users Facility continue.

Conventional Facilities (CF): The west CLO parking was paved and striped on May 10, 2004 prior to the DOE Review and the Joint Venture 3 Million Man-hour Safety Celebration. The communications ductbank and associated 900 pair cable have been installed, terminated and successfully tested. Wiring for the lighting for the West CLO parking lot and the CUB is currently being installed. This system is on track for in-service prior to the CLO June 14, 2004 move-in date. The design package and the statement of work for the Central Exhaust Facility have been furnished to the Construction Manager to prepare and issue the request for proposal (RFP). Bids for the CF portion of the Target Building I&C are being evaluated for award later this FY. The initial backfill over the last section of the RTBT tunnel has been placed. Readings to monitor settlement continue to be taken on a weekly basis and the results evaluated. The settlement, after placing additional material, has been minimal thus far. The remaining backfill at the Target interface will be placed after the Target Building substation retaining wall is complete. Rails for the telemanipulator in-cell bridge crane have been installed in the Target Building. The non-structural welds connecting the sections together are cracking and this problem is being addressed with the crane manufacturer. The CLO is 79% complete and work on the interior HVAC and piping, FP piping, electrical rough-in work, and cable tray installation is ongoing in all areas of the building. Drywall and acoustic tile installation is proceeding in all sectors and installation of the glass in the curtain wall is complete in the majority of the building. Outstanding issues are being worked as they come up but none have impacted the move-in date which is still on schedule for June 2004.



Project Overview and Assessment (con't)



Total Project	Apr04	Cum-to-Date
BCWS	23,062	1,130,949
BCWP	20,867	1,121,475
ACWP	16,648	1,113,065
CV	4,219	8,410
SV	-2,195	-9,474
CPI	1.25	1.01
SPI	0.90	0.99
Budget at Complete		1,383,527
Contingency		28,173
Total Project Cost		1,411,700

Total Project Cost (TPC)	\$1,411.7 M
Percent planned (cumulative)	81.7%
Percent complete (cumulative)	81.1%
Total Estimated Cost (TEC)	\$1,192.7 M
Cost and Commitments through 4/30/04	\$1,024M
Outstanding Phase Funded Awards	\$26.6M
Budget to Complete	\$140.1M
Contingency	\$28.2M
Estimate at Completion	\$ 1,167.4M
Remaining Contingency Based on EAC (21.4%)	\$ 25.3M

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 Hot Cell installation sequence. Currently, 22 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" that are being performed by the General Construction Contractor. The package involving installation of the Hot Cell equipment is being finalized and SNS personnel worked closely with the General Contractor to capitalize on all schedule optimization opportunities including parallel sequencing and double shifting.

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



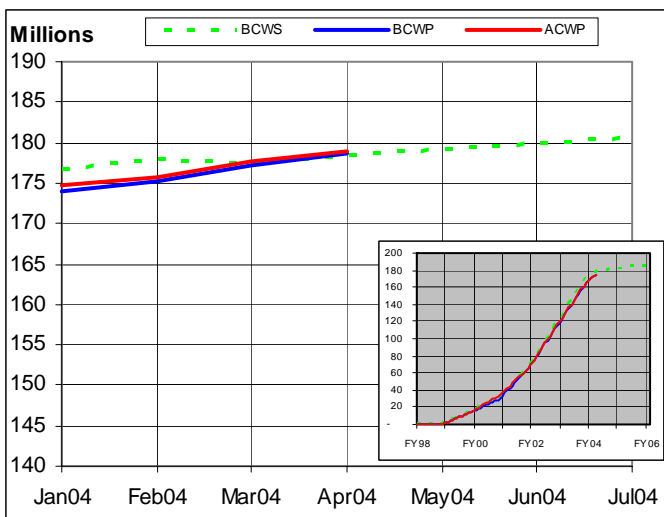
Highlights:

- The 3rd 805-MHz 5-MW Klystron was tested to full 5 MW of peak power at full duty factor. The next 5-MW klystron, number 4, was placed in the test socket.
- Three 805-MHz, 550-kW Thales klystrons have passed site acceptance tests and were shipped to Oak Ridge in May.
- DTL Tank-6 post couplers machining was completed. This was the last deliverable for the SNS DTL's.
- Both LANL HVCMS are now operational, one for the 5-MW klystron tests and one for the 550-kW klystron tests.

Last DTL tank at SNS

Assessment/ Issues: None at this time.

Performance and Milestones:



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

	Apr04	Cum-to-Date
BCWS	834	178,316
BCWP	1,458	178,551
ACWP	1,105	178,793
CV	353	-242
SV	624	235
CPI		
	1.32	1.00
SPI		
	1.75	1.00
Budget at Complete		183,448
Planned % Complete		97.2%
Actual % Complete		97.3%

Cost Performance:

Cause and Impact: The current period variance is due to an overstatement of BCWP in April that will be corrected in the May report. The cumulative cost variance is due to several activities which have long been completed but, for some reason, were not documented in the P3 schedule as such.

Corrective Action: The correct BCWP will be reflected in the May report.

Schedule Performance :

Cause and Impact: The current period variance is due to an overstatement of BCWP in April that will be corrected in the May report.

Corrective Action: None required.



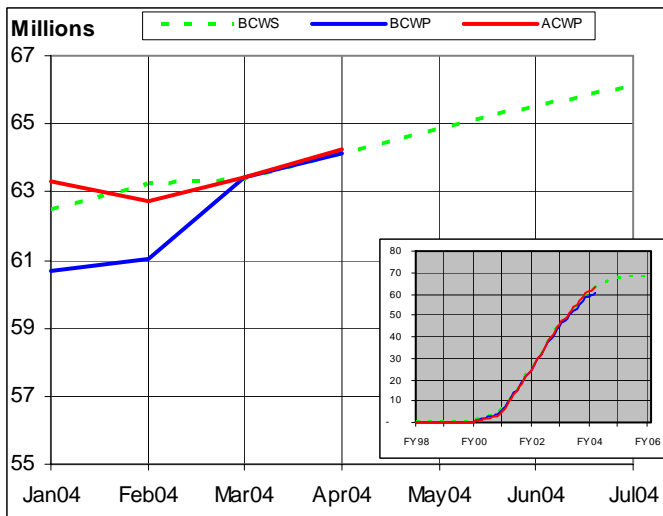
Highlights:

- Five High- β cavities were qualified.
- String Assembly for Cryomodule H-4 was completed
- Assembly of Cryomodule H-1 continued and assembly of Cryomodule H-3 was started.
- Testing of M-11 was started.

String assembly for cryomodule High- β 1

Assessment/Issues: Management attention is focused on maintaining the cryomodule fabrication schedule which is on track for March 2005 finish.

Performance and Milestones:



	Apr04	Cum-to-Date
BCWS	771	64,144
BCWP	723	64,147
ACWP	767	64,223
CV	-44	-76
SV	-48	3
CPI		
	0.94	1.00
SPI		
	0.94	1.00
Budget at Complete		68,358
Planned % Complete		93.8%
Actual % Complete		93.8%

Cost Performance:

Cause and Impact: The current month cost variance is due to the costs associated with performing the coupler testing at ORNL vs JLAB and the 1MW Klystron repair.

Corrective Action: None required.

Schedule Performance:

Cause and Impact: The current month variance is due to work that was planned for April but completed ahead of schedule. This work is reflected in the “near zero” schedule variance.

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 ✓



Magnets staged in the HEBT tunnel

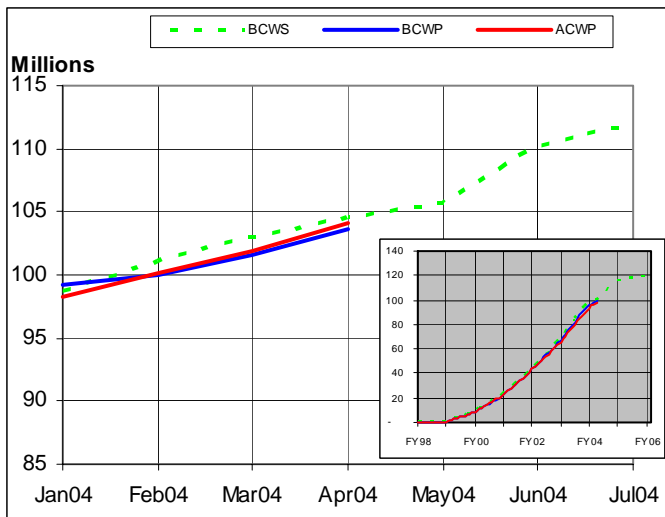
Highlights:

- During DTL1-3 commissioning, BNL watched live pulse images of the beam recorded by the BNL-built Beam-Position-Monitor (BPM) electronics and transmitted via an IP link. The 402 MHz electronics clearly observed real beam motion due to DTL #3 cavity tuning system problems.
- BNL actively supported the diagnostics commissioning and testing of the diagnostics prototype units at ORNL. Both the BPM electronics boards and the BNL-built Beam-Current-Monitor electronics were successfully tested. The Beam-Loss-Monitor (BLM) and the neutron detector also performed successfully during commissioning.
- Due to mechanical interferences, the edge of two 30-cm ID quadrupole magnets needs to be chamfered. Although the change in multipole harmonics and the integral-transfer-function (ITF) is negligible for the current corresponding to 1 GeV operation, the change of ITF at the field for 1.3 GeV operations is higher than desired due to saturation.
- A trial-assembly to check the mechanical compatibility of the injection section is underway at BNL. Both the vacuum chambers for chicane #4 and the injection dump septum need be modified. Also bend angles, radii, trajectory center points, mechanical geometry, and beam line trajectory are being finalized for each of the four Chicane magnets to finalize the Lattice drawing and provide accurate placement for the installation.
- The first injection kicker assembly (including the support standing, lifting fixture and power supply) was shipped to ORNL. Extra measures were taken to secure safe shipping and a BNL technician traveled to ORNL to help off-load, inspect, and set the magnet in its final configuration as well as confirm shipping methods and protection for future deliveries.
- Coating of the extraction kicker magnets with TiN is in progress. A plan to accelerate the delivery of straight-section beam-line components to support ORNL has been developed and an Estimate-To-Complete was conducted on the ring diagnostics systems. The Ring production plan document was developed. The arc quadrupole-corrector-dipole half-cell assemblies #25-27 were shipped to ORNL.

Assessment/Issues:

The globally high steel price is of concern. The extraction septum magnet vendor has notified BNL that they are unable to locate sufficient quantities of 1006 steel. Other sources and options are being explored.

Performance and Milestones:



	Apr04	Cum-to-Date
BCWS	1,619	104,631
BCWP	2,102	103,687
ACWP	2,221	104,043
CV	-119	-355
SV	483	-944
CPI		
	0.95	1.00
SPI		
	1.30	0.99
Budget at Complete		118,925
Planned % Complete		88.0%
Actual % Complete		87.2%

Cost Performance :

Cause and Impact: The current period cost variance is distributed across a number of lower level WBS elements and none of these are significant.

Corrective Action: None required.

Schedule Performance :

Cause and Impact: The current period variance is largely due to early receipt of HEBT medium field power supply materials from IE Power and high field magnet materials from Tesla. The cumulative schedule variance is due to delays associated with the Lambertson magnets.

Corrective Action: None required.

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



Target Systems– Oak Ridge National Lab



Target monolith work proceeding

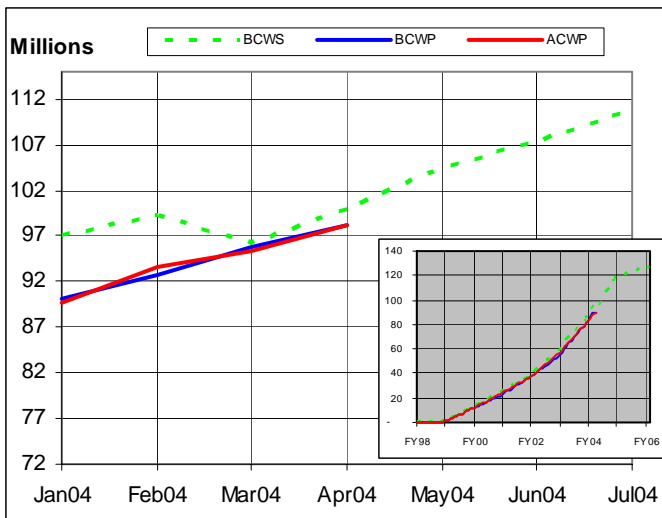
Highlights:

- All lower interstitials and outer guide rails and the guide block for the Proton Beam Window have been installed. The vessel insert installation lift fixture has been completed and will be available for use in the initial installation of the inserts.
- The Telerob manipulators have been installed on the pedestal manipulator and are now operational at the vendor.
- Two more single channel shutter gates were delivered and three out of twenty upper interstitials are now on site. The Mercury System Piping was shipped.
- Several vendor visits were made during the month of April. These include a visit to view the status of the manufacture of the mercury loop heat exchanger and a visit to witness the final testing of the mercury storage tank.
- As-built dimensions were received on the hot cell floor pan and are being evaluated to determine what modifications will be required to the target assembly components so that they can be installed properly.
- Contracts for fabrication of the the Mercury Loop Vacuum Pump Assembly and the hot cell floor shielding were awarded. A kickoff meeting was held with the vendor on the manufacturing of the target module. An agreement has been reached with the Target Protection System (TPS) vendor on monitor locations for the Uninterruptible Power System (UPS).

Assessment/ The installation schedule continues to be monitored closely.

Issues:

Performance and Milestones:



	Apr04	Cum-to-Date
BCWS	3,613	99,872
BCWP	2,415	98,229
ACWP	2,956	98,236
CV	-541	-7
SV	-1,198	-1,644
CPI	0.82	1.00
SPI	0.67	0.98
Budget at Complete		126,310
Planned % Complete		79.1%
Actual % Complete		77.8%

Cost Performance:

Cause and Impact: The current period cost variance is largely due to target shielding receipts. Due to financial concerns, the subcontractor bills weekly on incremental progress. However, earned value is taken only when the blocks are completed.
Corrective Action: None required.

Schedule Performance:

Cause and Impact: The schedule variance is due to delays in the target utilities installation package as well as delivery for the Hydrogen accumulator and completion of the DVTM Final design review.
Corrective Action: The installation package is being watched closely to ensure that the critical path is not impacted.

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



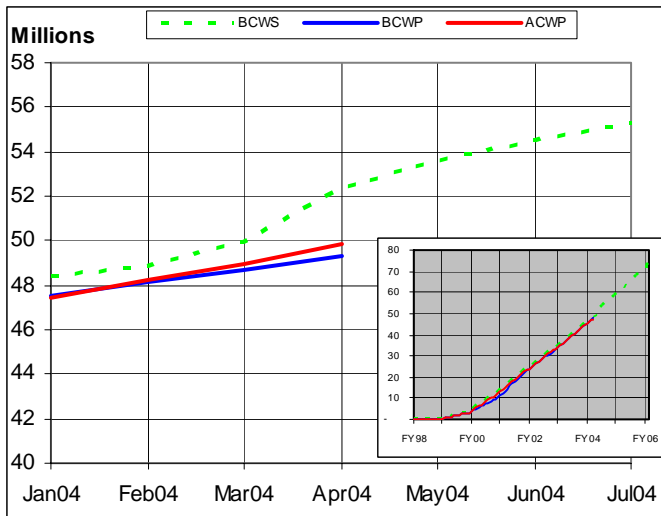
Backscattering chamber installation

Highlights:

- Neutron guides for backscattering spectrometer were delivered.
- A visit was made to the sample stage vendor for the liquids reflectometer, to discuss design details.
- The operating prototype version of SNS integrated data acquisition system was demonstrated at the EFAC meeting.
- The development of industrial robots and unconventional heating strategies to provide additional sample environment capabilities is being explored.
- One of the Reflectometer detector systems was successfully tested at the Californium Users Facility.
- Design of the production version of the detector module for the Powder Diffractometer has begun.

Assessment/ Issues: No issues at this time.

Performance and Milestones:



	Apr04	Cum-to-Date
BCWS	2,347	52,320
BCWP	711	49,356
ACWP	901	49,833
CV	-190	-477
SV	-1,635	-2,965
CPI		
	0.79	0.99
SPI		
	0.30	0.94
Budget at Complete		
		78,121
Planned % Complete		
		67.0%
Actual % Complete		
		63.2%

Cost Performance:

Cause and Impact: The current period cost variance is largely due to the correction of erroneous BCWP reported last month (in which an activity that had not started was erroneously reported as 100%).
Corrective Action: None required.

Schedule Performance:

Cause and Impact: The current period and cumulative schedule variances are due to delays in the analyzing optics for several instruments, a delay in insert receipt for the backscattering spectrometer, delayed delivery of the sample table for the magnetism reflectometer, a delay in detector effort for the SANS instrument and delay in receipt of the core vessel inserts. None of these delays affect the project's early finish date.
Corrective Action: The inserts have been received but not inspected and the analyzer system award should be ready to go by the end of April. The sample table will be complete by August and the SANS instrument baseline will need to be reviewed.

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



CLO to Target Bridge

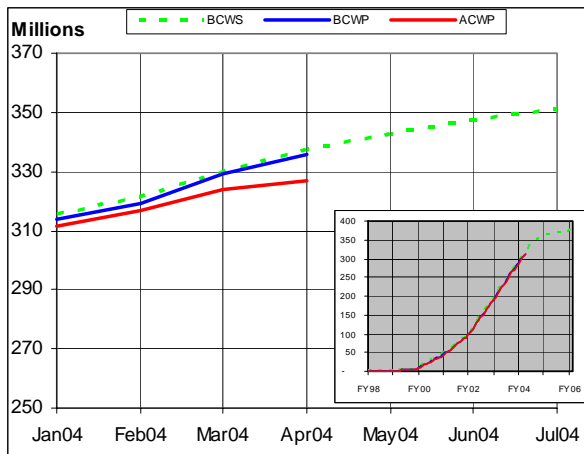
Highlights:

- The remaining backfill work over the RTBT Tunnel has restarted, with extensive monitoring of the RTBT settlement. The Liner and final backfill are expected to be complete in June 2004.
- Target General Construction effort continued with erection and detailing of the Compressor Building as well as completion of concrete placements for the Hot Cell North & South gallery walls and delay tank cavity. Hot Cell stainless steel liner plate coverings are in process on multiple shifts. Also, progress continues on fire protection sprinkler system piping, general piping systems, electrical systems, building siding, windows and roofing. Target Systems Package 2A and Package 6 installation continues. The Hot Cell RFE milestone for April 12, 2004 was successfully met on April 11, 2004 with commencement of the Target Cart rail installation. Additionally, the certification of the 50 Ton NOG1 crane is in process.
- Move-in of furniture and personnel into the CLO is on track for June 2004. The Pedestrian bridge structural steel has been completed with the exception of some touchup painting. Work continued on the CLO West Plaza concrete, which is needed for CLO personnel access. Also, progress continues with drywall installation, mechanical and electrical installation, installation of siding and windows, roofing and selected finishes. Installation of the F4 and P3/P4 elevators continues.
- Installation of the Fire Alarm System in the CLO Building continues, where work is ongoing in all sectors. Work in the Target Building began in May.
- The Paving Subcontractor has successfully completed the initial tasks for the western portion on the SNS site and began work on the CLO west parking lot. This represents the last paving effort in FY04. The Communication Ductbank installation was completed to the CLO and final testing began in May.

Assessment/ Issues:

The critical milestone impacting Target Systems equipment installation was met and the goal of achieving partial occupancy of the CLO in June 2004 is on track.

Performance and Milestones:



	Apr04	Cum-to-Date
BCWS	7,439	337,408
BCWP	6,910	335,976
ACWP	3,261	327,041
CV	3,649	8,935
SV	-529	-1,433
CPI	2.12	1.03
SPI	0.93	1.00
Budget at Complete		378,912
Planned % Complete		89.0%
Actual % Complete		88.7%

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 current period positive cost variance is the result of progressing activities this month that were added via PCR last month, as well as an error in the accrued retention for both the Target and CLO Building. Approximately 1.2M of the cumulative cost variance is due to contractual issues with the structural steel, the remainder is due to unaccrued retention costs.

Corrective Action: The contractual issues with the steel are being worked.

Schedule Performance:

Cause and Impact: The current period negative schedule variance is primarily in the CLO General Construction (-\$200K) and CF Local Controls, which has been deferred until FY05 (-\$336K).

Corrective Action: None required.



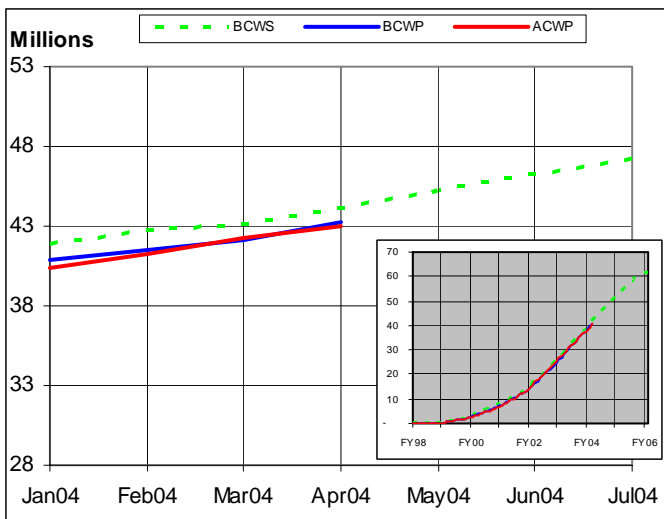
CHL 2K cold box

Highlights:

- In addition to supporting DTL 1-3 beam operations this month, the controls team was able to support the successful conditioning of CCL1, all subsystems having been installed and tested earlier. Finally, the controls team completed all necessary installation and testing and then supported initial operation of the CHL main 4.5K cold box. That system also ran very reliably.
- The DTL 1-3 run was under Personnel Protection System (PPS) Phase 0.4a. RF processing of CCL1 was under PPS Phase 1 “lite.” The next PPS phases have been defined. The next PPS phase, named 1.1, will provide access control for the entire Linac and operation as a Radiation Generating Device. RF processing for the complete CCL will be possible. Following phase 1.1 will be phase 1.2 which will separate the warm and cold sections of the Linac with a shield wall (no gate). Each section will be controlled independently, allowing RF processing in the cold section, and beam commissioning in the warm section. PPS cabling in the HEFT began this month. These cable runs are for HEFT equipment in the tunnel including BSSs, gates, doors, and chipmunks. A plot of residual and prompt radiation dose rates for the Injection area of the Ring was obtained. This will be the basis for defining the boundaries of subsegments within the Ring and for locating BSSs.
- Considerable progress has been made on the Hot Spare stand. The 65KV controller is tested and ready to install, as is the QEI RF Pulse Generator. Fiber Receiver and Fiber Transmitter Boards are stuffed and installed. Software for the Cs Heater controller for both “blue boxes” is complete, and wiring is in progress. Only the Steerer supplies, the Matching Network, and the 65Kv switch remain unfinished.

Assessment/Issues: No issues at this time.

Performance and Milestones:



	Apr04	Cum-to-Date
BCWS	1,059	44,169
BCWP	1,049	43,234
ACWP	834	43,059
CV	215	175
SV	-11	-936
CPI	1.26	1.00
SPI	0.99	0.98
Budget at Complete		61,449
Planned % Complete		71.9%
Actual % Complete		70.4%

Cost Performance:

Cause and Impact: The current period cost variance is largely due to work in Target Controls which has been completed. The vendor invoice, however, was not received. A similar situation also occurred with the MPS hardware.

Corrective Action: None required; invoices will be received and processed or accruals will be made.

Schedule Performance:

Cause and Impact: The schedule variance is largely due to activities in the Ring controls area. None of these delays impact commissioning activities.

Corrective Action: The current plan is being reviewed.

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



5 MW Klystron

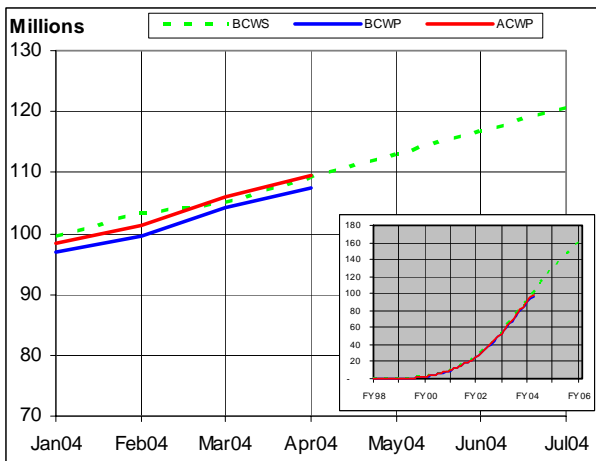
Highlights:

- DTL Tanks 1-2-3 beam commissioning was started April 12 and completed April 23. The beam was successfully transported to the beam stop downstream of DTL-3 shortly after noon on April 13th. The Ion Source and DTL RF have been remarkably trouble free and 38 mA of beam was transported with essentially 100% transmission. The beam was initially transported with essentially no use of steering. The Beam Loss Monitor system was further developed as well with many significant measurements and calibrations taken. Results are being analyzed.
- CCL-1 RF conditioning has begun. CCL-1 quads have been installed and PS testing performed. CCL-2 cooling manifolds have been installed and vacuum and cooling cable terminations are in progress. CCL-3 segments have been installed on the support frame. CCL-4 was shipped from ACCEL.
- The warm helium compressors have been running, purging the 4.5K cold box of impurities which is now within acceptable limits. Plans are to clean the turbine filters, install the expanders and continue on with the commissioning of the 4.5K cold box.
- The vendor for the 2.1K cold compressor connectors is able to produce a connector that will meet the requirements of the cold compressors. The vendor is producing a schedule for the production and installation of the connectors.
- Input power couplers are being tested in the ONL RFTF in support of JLAB cryomodule production. Several couplers have been successfully tested and shipped back to JLAB for cryomodule installation.
- Ring deliveries and installation continues at a good pace. An injection kicker, power supply and support stand have been received at ORNL. The RING Half-Cell #25 was installed. Half-cell #26 has been staged in the tunnel.

Assessment/ Issues:

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

Performance and Milestones:



	Apr04	Cum-to-Date
BCWS	3,942	109,080
BCWP	3,255	107,600
ACWP	3,430	109,413
CV	-175	-1,813
SV	-687	-1,480
CPI	0.95	0.98
SPI	0.83	0.99
Budget at Complete		172,139
Planned % Complete		63.4%
Actual % Complete		62.5%

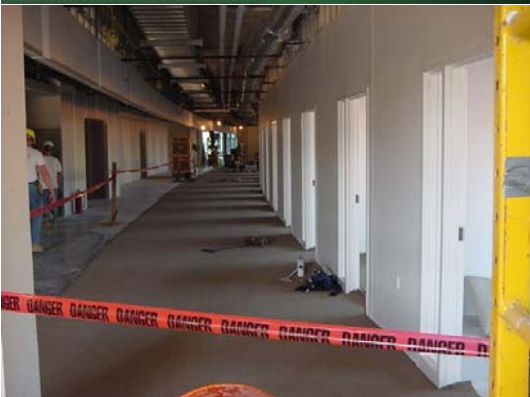
Description	Milestone Date	Forecast Date
Start Front End Installation	Sep-02	Jun-02 ✓
Start Linac Installation	Sep-02	Apr-03 ✓
Start Ring Installation	Aug-03	Jul-03 ✓
FE Beam Available to DTL	Mar-03	Dec-02 ✓
Linac Beam Available to HEBT	Aug-05	May-05
HEBT& Ring Beam Available to RTBT and Target	Feb-06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

Cost Performance:

Cause and Impact: The current month cost variance is due to under reporting of status for diagnostics procurements. The cumulative cost variance is due to klystron replumbing, DTL recovery, transfer line leaks, cryomodule production issues and CHL compressor skids manufacturing problems.
Corrective Action: Several potential offsets have been identified.

Schedule Performance:

Cause and Impact: The current and cumulative schedule variances are due to delays in CCL and HPRF procurements and the under reporting of status for Linac diagnostics procurements.
Corrective Action: None required.



CLO Construction

Highlights:

- The SNS Megaconstruction Project Oversight Committee was featured in “A New Model for Labor-Management Relations”, written by Barbara Haskew and published in *Tennessee’s Business*.
- The Linux clusters for XFD and ASD have been moved to ORNL and will remain there until they have a permanent home in the CLO.
- QA support for ASD continues with inspections and ACL documentation being the main focus. Post couplers for the remaining DTL tanks were successfully measured and accepted for installation. Mechanical inspection of other components continues to be satisfactory.
- All calibration coordinators have now submitted their equipment calibration listings to the SNS QA group. These group equipment lists, along with a statement of work, pave the way for obtaining cost bids from “outside” calibration service organizations. The listing will also be sent to the ORNL equipment calibration group for the purposes of obtaining an “inside” bid as well.
- ASD physicist Sang-ho Kim was presented the 2004 Outstanding Young Researcher Award (OYRA) by the Association of Korean Physicists in America (AKPA). The OYRA Committee stated, “Dr. Kim has made an outstanding contribution to the superconducting cavity science in his young research career.”

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

External Review Data:

Progress on recommendations from external reviews in March and April:

Review	Recommendations	Closed This Month	Open Actions
DOE SC Review (11/03)	25	0	1
DOE SC Review (5/03)	29	0	1

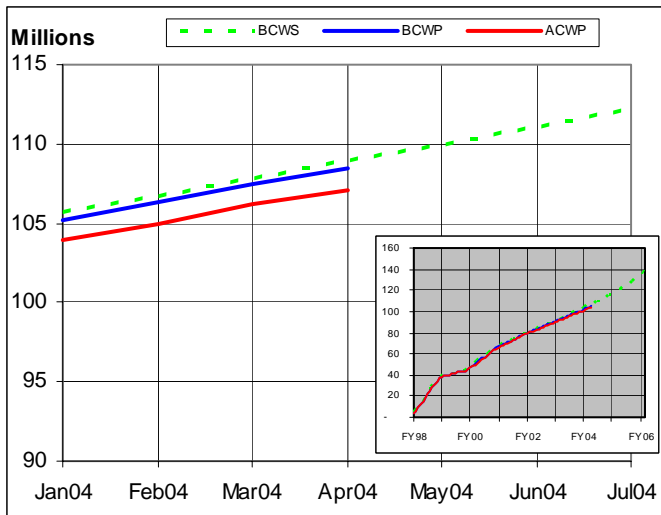
Life of Project Market Experience:

Major Awards (\$M)	Baseline Estimate (\$M)	Baseline Savings (\$M)	Percent savings over baseline
547.6	511.3	-36.2	-7.1%

Through May 24, 2004: 98% of the major procurements are already awarded.



Performance:



	Apr04	Cum-to-Date
BCWS	1,090	108,907
BCWP	1,089	108,490
ACWP	936	107,135
CV	153	1,355
SV	-1	-417
CPI		
CPI	1.16	1.01
SPI		
SPI	1.00	1.00
BAC (1.2)		
BAC (1.2)		75,636
BAC (1.10.3, 1.1.13, 1.10.5)		
BAC (1.10.3, 1.1.13, 1.10.5)		71,284
Planned % Complete		
Planned % Complete		74.1%
Actual % Complete		
Actual % Complete		73.8%

Cost Performance:

Cause and Impact: The cost variance is largely due to increased efficiencies and improper phasing of move costs. The latter should have been isolated to June 2004 and rather was spread across FY04.
Corrective Action: None required.

Schedule Performance:

Cause and Impact: None required.
Corrective Action: None required.

Milestones:

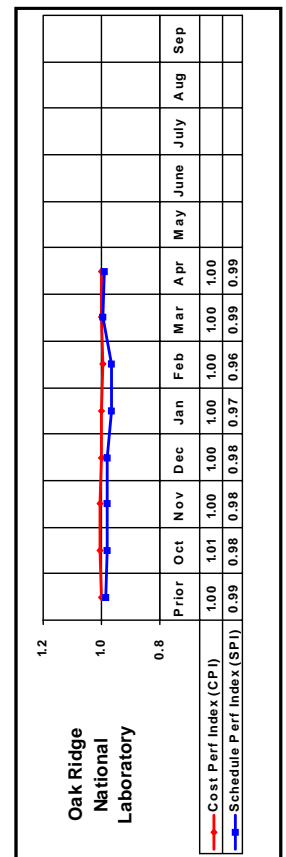
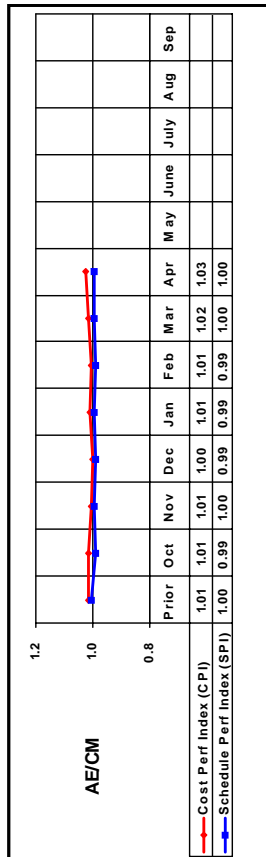
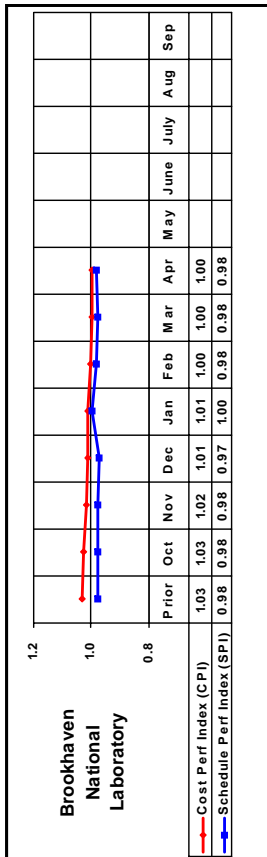
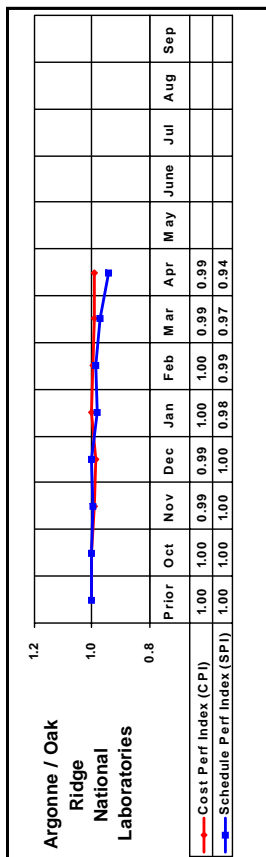
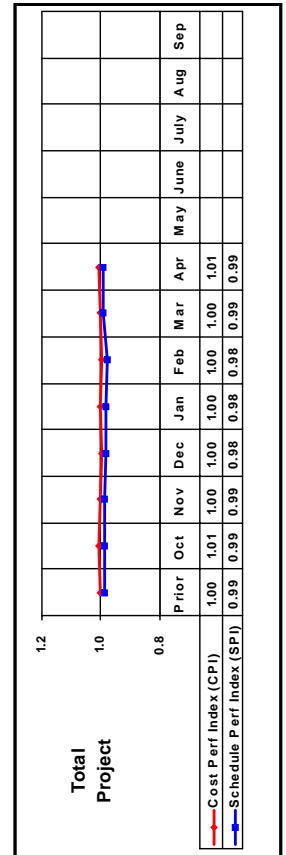
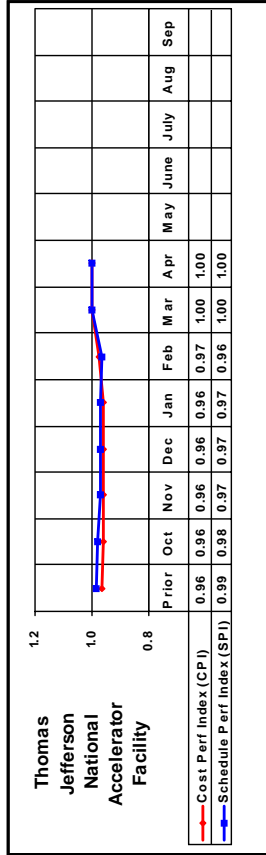
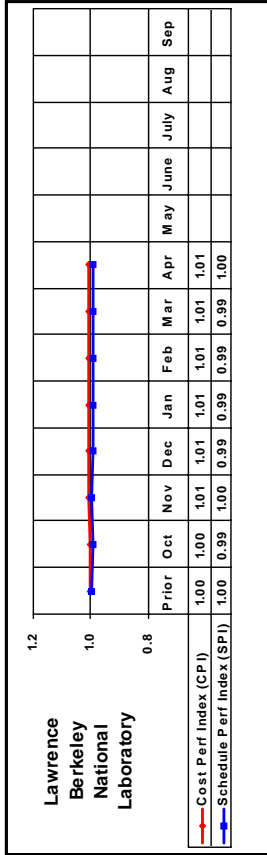
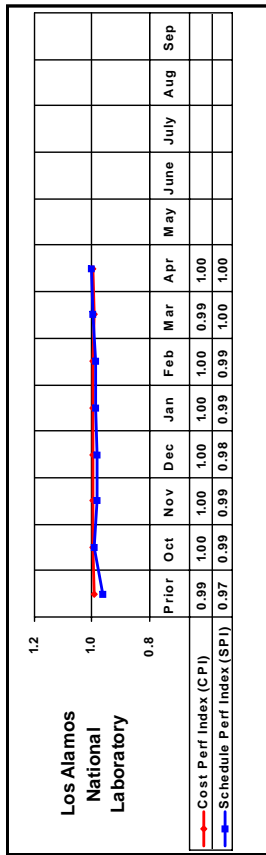
Description	Milestone Date	Forecast Date
EIS ROD	Jun-99	Jun-99 ✓
PSAR Issued for Approval	Dec-99	Dec-99 ✓
Submit PSAR to DOE for Approval	Dec-99	Dec-99 ✓
PSAD issued for Information	Sep-00	Sep-00 ✓
Issue FSAD for approval (Front End and Linac)	Sep-02	Aug-02 ✓
Issue FSAD for approval (Ring and Transfer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

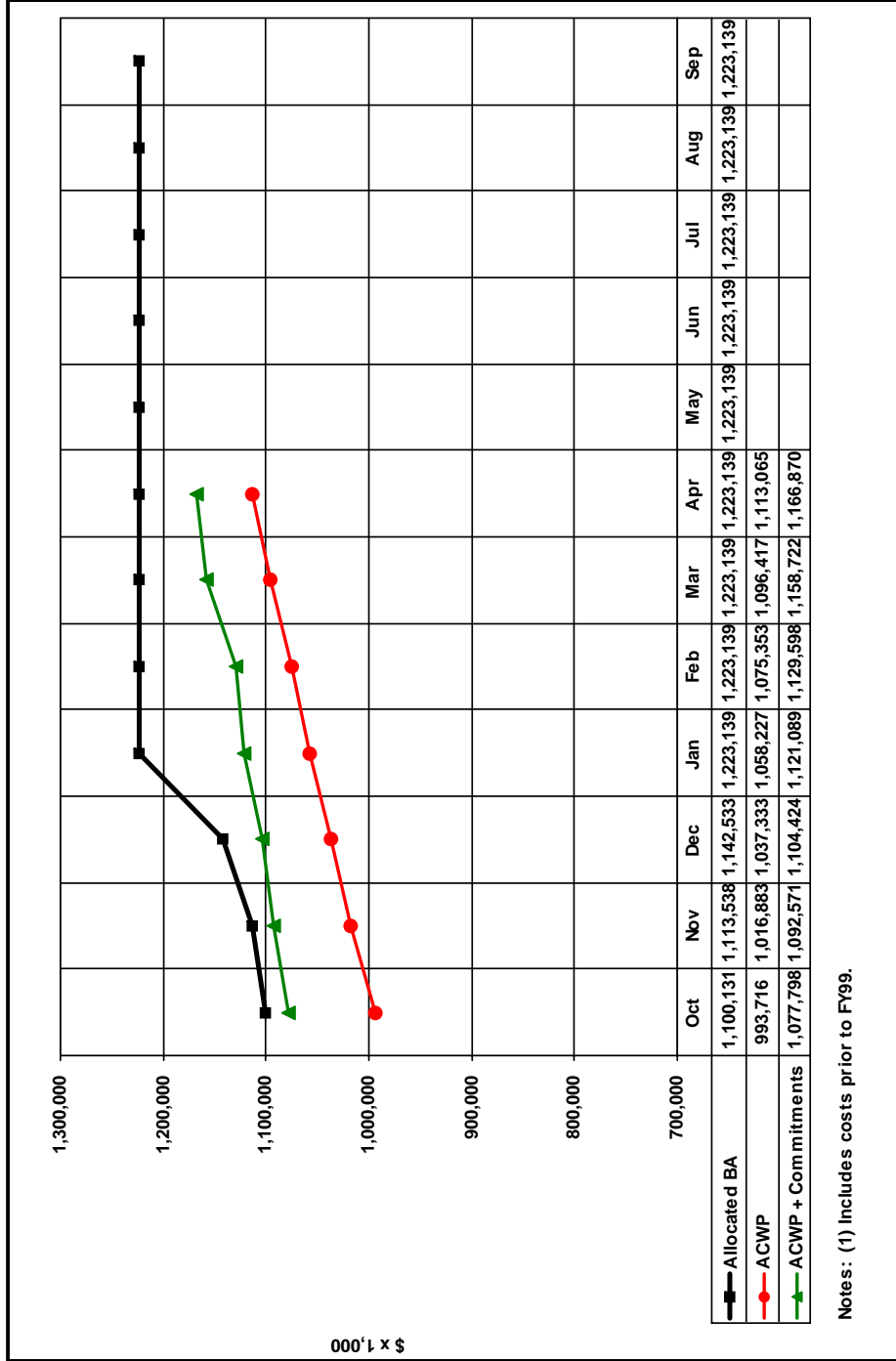




Overall Project Performance is stable



TPC Obligation Profile against BA



Phase funded procurements at the end of March could obligate an additional \$26.6M, raising the total obligation potential to \$1,193M.



PROJECT TITLE:	REPORTING PERIOD:		CUMULATIVE TO DATE												AT COMPLETION			
	April 01, 2004 through April 30, 2004		CURRENT PERIOD				BUDGETED COST				ACTUAL COST				VARIANCE		BUDGET (BAC)	ESTIMATE (EAC)
	PROJECT NUMBER:	START DATE:	BUDGETED COST	WORK SCHED	WORK PERF	ACTUAL COST	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	ACTUAL COST	SCHED	COST	BUDGET (BAC)	ESTIMATE (EAC)	
Spallation Neutron Source Project	99-E-334	October 1998	760.7	760.7	859.2	0.0	0.0	859.2	64,394.1	64,394.1	63,339.5	63,339.5	64,394.1	(0.0)	1,054.6	75,636	75,136	
Oak Ridge National Laboratory Oak Ridge, TN		June 2006	0.0	0.0	0.0	0.0	0.0	0.0	20,832.0	20,832.0	20,907.7	20,907.7	20,832.0	0.0	(75.7)	20,832	20,832	
1.02 Project Support			4,315.0	4,045.6	4,185.0	(269.5)	(139.4)	288,053.1	286,466.6	288,973.1	286,466.6	288,973.1	286,466.6	(1,586.5)	(2,506.6)	315,969	316,823	
1.03 Front End Systems			1,974.6	2,615.5	2,614.9	640.9	0.5	114,931.0	114,331.4	114,580.0	114,331.4	114,580.0	114,331.4	(599.6)	(248.6)	142,001	142,361	
1.04 Linac Systems			3,613.4	2,415.3	2,955.8	(1,198.1)	(540.5)	81,717.6	80,074.0	80,081.2	80,074.0	80,081.2	80,074.0	(1,643.6)	(7.2)	108,155	109,006	
1.05 Ring & Transfer System			2,271.7	641.2	965.0	(1,630.6)	(323.8)	38,406.9	35,629.5	35,916.0	35,629.5	35,916.0	35,629.5	(2,777.4)	(286.5)	63,277	63,498	
1.06 Target Systems			7,438.8	6,910.2	3,260.8	(528.6)	3,649.4	337,408.4	335,975.5	327,040.7	335,975.5	327,040.7	335,975.5	(1,432.9)	8,934.8	378,912	379,875	
1.07 Instrument Systems			1,059.3	1,048.7	833.7	(10.6)	215.0	42,464.9	41,529.3	41,354.2	41,529.3	41,354.2	41,529.3	(935.6)	175.1	59,745	59,845	
1.08 Conventional Facilities			21,433.6	18,437.1	15,674.4	(2,996.5)	2,762.7	988,208.0	979,232.4	972,192.5	979,232.4	972,192.5	979,232.4	(8,975.6)	7,039.9	1,164,526	1,167,375	
1.09 Integrated Control Systems																28,174	25,325	
CONTINGENCY																		
TOTAL LINE ITEM			21,433.6	18,437.1	15,674.4	(2,996.5)	2,762.7	988,208.0	979,232.4	972,192.5	979,232.4	972,192.5	979,232.4	(8,975.6)	7,039.9	1,192,700	1,192,700	
1.01 Research & Development			75.0	70.2	(63.8)	(4.8)	133.9	99,069.7	98,882.1	99,148.5	98,882.1	99,148.5	98,882.1	(187.6)	(266.4)	100,000	100,000	
1.10 Operations			1,553.7	2,359.8	1,036.9	806.1	1,322.8	43,670.7	43,360.1	41,723.7	43,360.1	41,723.7	43,360.1	(310.7)	1,636.4	119,000	119,000	
OTHER PROJECT COSTS SUBTOTAL			1,628.7	2,429.9	973.2	801.3	1,456.7	142,740.5	142,242.2	140,872.2	142,242.2	140,872.2	142,242.2	(498.3)	1,370.0	219,000	219,000	
TOTAL PROJECT COST			23,062.3	20,867.0	16,647.6	(2,195.2)	4,219.4	1,130,948.5	1,121,474.6	1,113,064.7	1,121,474.6	1,113,064.7	1,121,474.6	(9,473.9)	8,409.8	1,411,700	1,411,700	
RECONCILIATION TO CONTRACT BUDGET BASE												DATE: May 20, 2004						
DOLLARS EXPRESSED IN: Thousands																		



PROJECT TITLE: Spallation Neutron Source Project		REPORTING PERIOD: April 01, 2004 through April 30, 2004												PROJECT NUMBER: 99-E-334		
PARTICIPANT NAME AND ADDRESS: Oak Ridge National Laboratory Oak Ridge, TN		BCWS PLAN DATE: April 2004												START DATE: October 1998		
		BUDGETED COST FOR WORK SCHEDULED (NON - CUMULATIVE)												COMPLETION DATE: June 2006		
ITEM	BCWS CUM TO DATE	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	FY Total	Out Years	Budget at Completion
PM BASELINE (BEGINNING OF PERIOD)	862,169	17,125	19,307	18,982	21,567	17,640	9,985	21,434	18,880	18,649	15,948	15,217	14,460	209,193	94,135	1,165,497
1.02 Project Support		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.03 Front End Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.04 Linac Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.05 Ring & Transfer System		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.06 Target Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	(971)	(971)
1.07 Instrument Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.08 Conventional Facilities		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.09 Integrated Control Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL AUTHORIZED CHANGES		-	-	-	-	-	-	-	-	-	-	-	-	-	(971)	(971)
PM BASELINE (END OF PERIOD)	862,169	17,125	19,307	18,982	21,567	17,640	9,985	21,434	18,880	18,649	15,948	15,217	14,460	209,193	93,164	1,164,527

RECONCILIATION TO CONTRACT BUDGET BASE

DATE: May 20, 2004

DOLLARS EXPRESSED IN: Thousands

Project Change Requests implemented in April are as follows:

Revision	PCR Number	Description	Impact (Cost/Sched/Tech)	Actual Cost Impact (Total \$)
R494	SN-04-007	IPS Update	Sched	-
R495	AS-04-008	De-Scope HEBT Cavities	Cost/Sched	(971)



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)— $TEC + OPC$