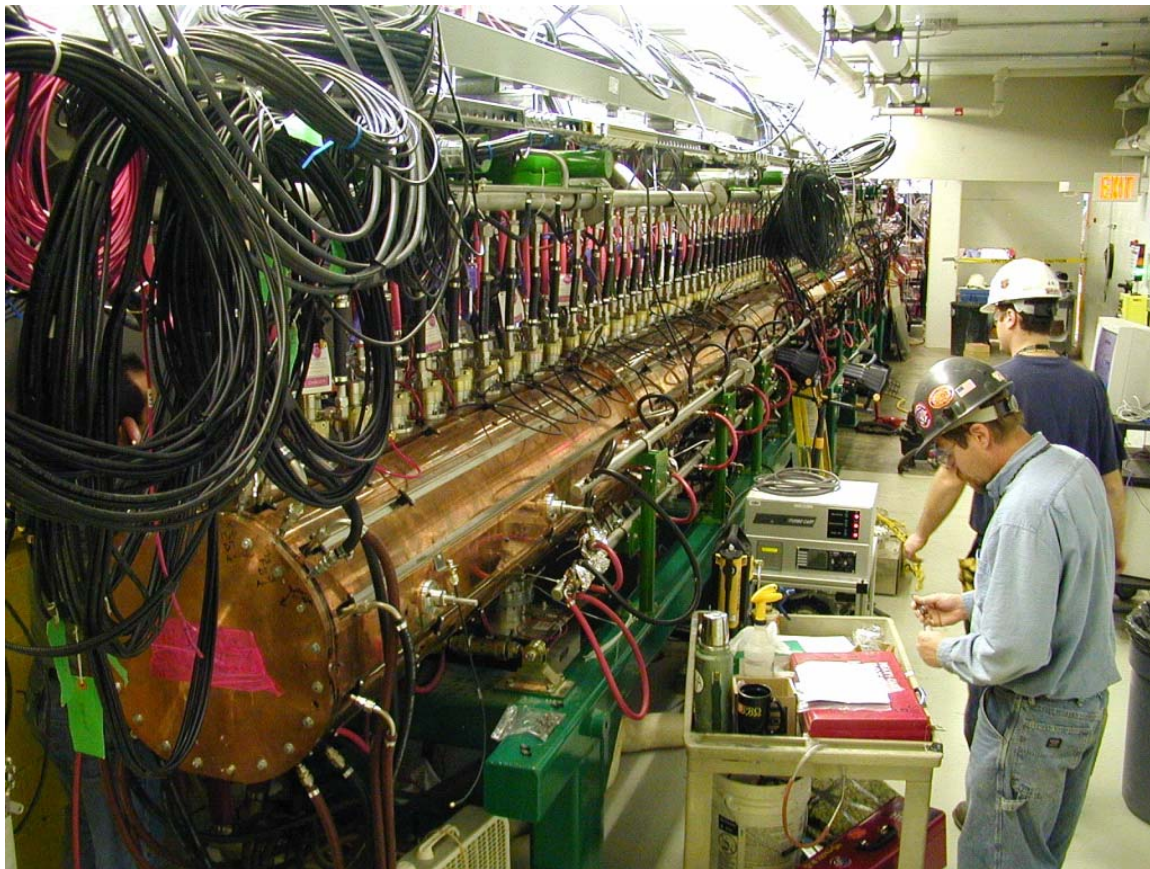


The Spallation Neutron Source Monthly Report

January 2004



A U.S. Department of Energy Multilaboratory Project

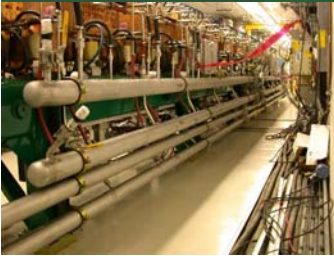
SPALLATION NEUTRON SOURCE
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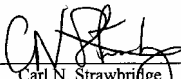
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CCL Cooling Manifolds

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


 Carl N. Strawbridge
 SNS Deputy Project Director
 3/9/04
 Date

Highlights and Issues:

- Good project performance continues with a minor cumulative schedule variance of 1.6% against the March 2006 early finish schedule. Through the end of January, 77.3% of the project is complete. Completion percentages are:
 - ◊ 97 % of R&D
 - ◊ 94 % of design
 - ◊ 73 % of technical hardware (including procurement and fabrication)
 - ◊ 84 % of conventional construction
 - ◊ 47 % of installation
- Contingency continues to be tight. The available contingency balance of \$40.7M will be reduced to \$25.7M once the changes identified in the Estimate at Completion are incorporated into the baseline. Approximately \$5M of undistributed pre-operations budget is also available.
- Excellent safety performance continues. Through 23 January, 2004, the total Project has worked in excess of 4.7 million hours with 54 recordable injuries (an increase of 2 from last month) and no lost work day (away) cases.
- Steady progress continues on DTL and CCL components; deliveries are on track to support the commissioning schedule. The transition of work from LANL to ORNL is also progressing smoothly.
- The production schedule for the superconducting cryomodules at Jlab and the associated costs of maintaining the schedule are being monitored closely. Backup plans have been prepared to maintain the cryogenic system startup/commissioning schedule while resolving the issues associated with the feedthrough leaks and damaged compressors.
- The integration of the target installation packages in the Target building construction schedule is on track; parallel activities and/or double shifts are being utilized where practical to reduce the total duration.

Assessment:

Accelerator Systems Division (ASD): Except for final vacuum, DT1-1 and DTL-3 are ready for the Accelerator Readiness Review. All drift tubes for DTL-2 have been installed and final alignment is underway. The RF systems for the RFQ and DTLs 1-3 are also ready. DTL-4 is mechanically ready except for the final-machined post couplers and DTL-5 is being tuned. All of the drift tubes for DTL-6 are also at ORNL. Coupled Cavity Linac (CCL) 2 components were received at the SNS site. The support frames have been set on the beam line and leveled and segment installation has begun. The Thales 5MW tube for CCL-1 has been tested at both LANL and ORNL and is presently operating at 4.0MW at 20Hz with 1.0ms pulses. All cavities required for the medium- β cryomodules have been qualified at JLAB. However, a new problem on High- β qualification is now being worked. The High Power and Low Power RF systems for CCL-1 are ready. The first-article High-Power Protection Module (HPM) and Field Control Module (FCM) printed circuit boards (4 boards) have been received at ORNL and passed the first round of acceptance tests in the lab. The remainder of the Phase I production (20 sets) is due for completion by the end of the month. The first shipment of Analog Front End (AFE) printed circuit boards was also received. A review of the Ring beam diagnostics system and progress by the Beam Diagnostics Review Committee was held February 5-6 at BNL. Specific recommendations and plans were made and are being implemented. The Division is also preparing for the ASAC Review at Oak Ridge on March 9-11.

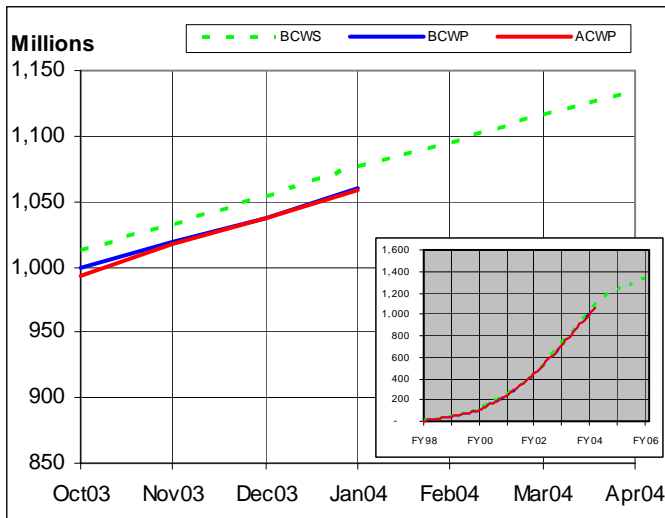
Experimental Systems Division (XFD): Target Systems installation continues. Installation of all the chimney shield rings and the vertical supply and return pipes has been completed. The Upper Locating Plate and three of the large Pan Shielding rings have been installed as well. The Core Vessel Chimney has been installed and the large weld to the vessel is complete. All Forward/Backward Blocks, 19 (of 20) lower

interstitial blocks and six more Inner Guide Rails have been received. The final review for helium compressor system and the 90% design review of the Shutter Control System have been held. Contracts for the Hydrogen System and the Ring Injection Dump hardware were awarded and the cost and schedule proposal for installation package 3 has been received from the General Contractor. Testing plans for the FERNs Prototype Sample Changer at HFIR are being finalized. Calculations on the illumination of instrumented beamlines by the outer reflector indicated negligible levels of illumination and thus, eliminated the requirement for cadmium lining of the outer reflector plug surfaces. The choppers for the Backscattering Spectrometer have passed the acceptance testing and will soon be installed into the General Purpose Powder Diffractometer instrument at Argonne. The final version first article of the bandwidth chopper support for SNS installation is being fabricated.

Conventional Facilities (CF): Construction activity continues in several areas. Piping work in the utility vaults of the Target Building, sprinklers in the high bay and installation of piping hangers are all proceeding well. Glass installation has begun on the south side of the building. The hanger installation process has been simplified by the use of smaller anchors and a rebar detector. The platforms for the Target cask cart have arrived and are being installed under the hot cell. The installation of the RTBT Liner System awaits completion of backfill and underground electrical duct work in and around the Target Building and Helium Compressor Building. Work has accelerated in the hot cell area upon implementation of a second shift and the hot cell liner subcontractor has started installation. Mechanical and electrical work is ongoing throughout the CLO. The current "move in" date is still on schedule for June 2004. The foundation for the northern most tower support bridge has been redesigned using driven H-piles to negate the poor soil quality in the area. Bridge steel has already been fabricated and is on long bed trucks awaiting orders to ship.



Project Overview and Assessment (con't)



Total Project	Jan04	Cum-to-Date
BCWS	23,081	1,077,181
BCWP	22,552	1,059,554
ACWP	20,894	1,058,227
CV	1,658	1,327
SV	-529	-17,627
CPI	1.08	1.00
SPI	0.98	0.98
Budget at Complete	1,370,980	
Contingency	40,720	
Total Project Cost	1,411,700	

Total Project Cost (TPC)	\$1,411.7 M
Percent planned (cumulative)	78.6%
Percent complete (cumulative)	77.3%
Total Estimated Cost (TEC)	\$1,192.7 M
Cost and Commitments through 1/31/04	\$982.8M
Outstanding Phase Funded Awards	\$45.8M
Budget to Complete	\$169.2M
Contingency	\$40.7M
Estimate at Completion	\$ 1,167M
Remaining Contingency Based on EAC (~19%)	\$ 25.7M

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 resides in Target System's Hot Cell installation sequence. There is no single area in the Target schedule that shows negative float, and there is one month of positive float at the end of this path to the March 30, 2006 early finish date. 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". Six of the eleven packages have been awarded to the General Construction (GC) contractor and two more will be awarded imminently. SNS personnel are currently working with the General Contractor in an effort to capitalize on all opportunities for double shifts and parallel sequencing of activities. The GC's proposed schedule for the installation of the Hot Cell equipment is now being negotiated. All of the installation efforts are being monitored closely.

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



DTL Vacuum Test Stand at ORNL

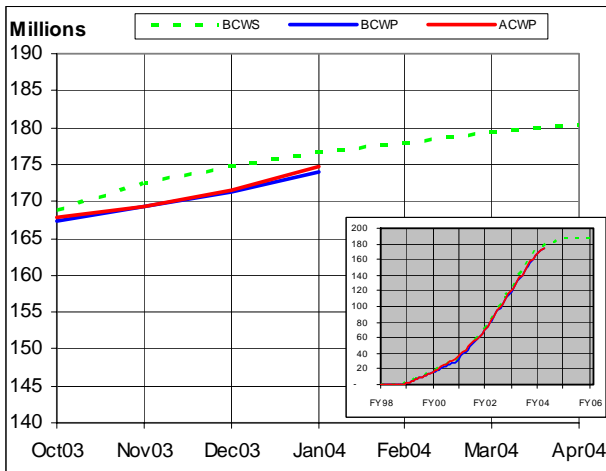
Highlights:

- LANL support of the installation and testing of RF systems at ORNL continued, including work with the vendor to replace the defective SCL flexible waveguide. Site acceptance tests of the second 5-MW (CCL) klystron at LANL also continued, but problems operating the HVCM at full power caused a delay in these tests.
- Two 2.5-MW CCL windows were conditioned and shipped to ORNL. LANL also authorized the shipment of two more 2.5-MW (DTL) klystrons and several more 550-kW CPI (SCL) klystrons to ORNL.
- Troubleshooting and rebuilding both the prototype and production HVCMs at LANL to support the high-power RF tests continues.
- All DTL drift tubes have now been delivered except for two that require rebuilding after failing their bakeout and leak tests.
- Tuning of CCL Module 2 at ACCEL was completed and it was shipped to ORNL. CCL Module 3 is scheduled for delivery in March and Module 4 in April.
- The electronics for the Faraday cup/degraders for the DTL and CCL were also shipped to ORNL. The remaining electronic chassis for the BPM and wire-scanner systems are being assembled.
- Reviews were held and fabrication orders were placed for the RTBT harp and the transition-region beam stop.

Assessment/ Issues:

Key issues being worked at this time are the CCL #4 module delivery schedule, repair of the remaining DTL Tank 2 drift tubes and re-work of the non-compliant SCL waveguide.

Performance and Milestones:



	Jan04	Cum-to-Date
BCWS	1,973	176,635
BCWP	2,729	174,087
ACWP	3,230	174,660
CV	-501	-572
SV	755	-2,548
CPI		
	0.84	1.00
SPI		
	1.38	0.99
Budget at Complete		
		186,125
Planned % Complete		
		94.9%
Actual % Complete		
		93.5%

Cost Performance:

Cause and Impact: None required

Corrective Action: None required

Schedule Performance :

Cause and Impact: The schedule variance is largely due to delayed delivery of production klystrons and CCL cavities.

Corrective Action: Continued vendor liaison will be performed to ensure the schedule and quality of deliverables is maintained. Currently there is no impact on the project's early finish date.

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



String Assembly for cryomodule M-9

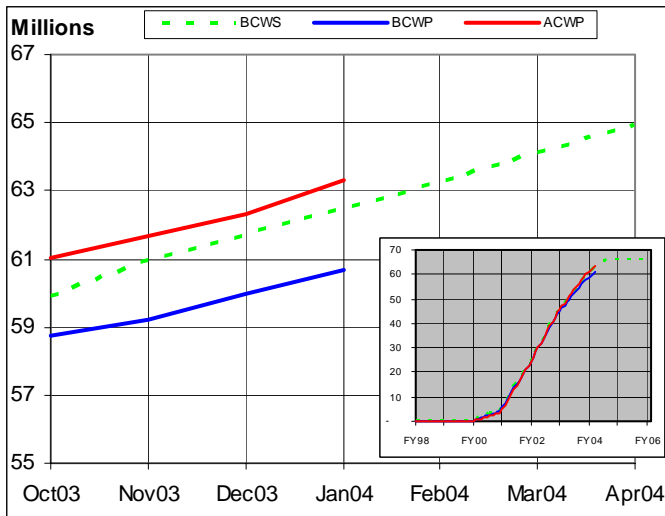
Highlights:

- One additional Medium-β cavity was qualified this month. All cavities required for all Medium-β cryomodules have been qualified. One additional High-β cavity was qualified this month
- String Assembly for cryomodule M-9 was completed and pre-assembly started in a storage area.
- Assembly of cryomodule M-8 was completed. It was rolled off the rails and will be cooled down in February.
- Cryomodules M-4, M-5 and M-6 have been shipped to ORNL.

Assessment/ Issues:

- Testing and qualification of Medium-β cavities has shown significant improvement however, a new problem with the High-β cavities is now being worked. An ETC will be performed in March. This will incorporate a revised finish date for the cryomodule production as well as a detailed review of offsets to the cost variance.
- The cavity qualification process has been impeded by the failure of the High Pressure Rinse pump(s). The third failure was confirmed on January 15, 2004. Considerable effort has been put into determining the cause and developing solutions or corrective actions which will solve this problem.

Performance and Milestones:



	Jan04	Cum-to-Date
BCWS	774	62,505
BCWP	699	60,671
ACWP	970	63,311
CV	-271	-2,640
SV	-75	-1,834
CPI		
	0.72	0.96
SPI		
	0.90	0.97
Budget at Complete		
		66,044
Planned % Complete		
		94.6%
Actual % Complete		
		91.9%

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: Cavity qualification processes have been modified in accordance with the recommendations of the external review committee, resulting in an increased qualification yield for the Medium-β cavities. An ETC will be implemented in March 2004 and appropriate changes will be incorporated into the baseline.

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.

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



Ring Half-Cells in the Ring Tunnel

Highlights:

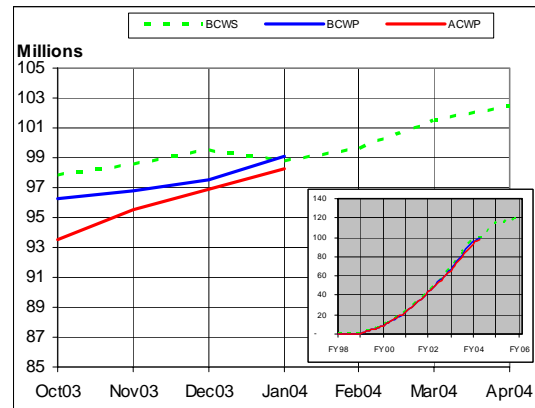
- The low-profile lifting fixture fabricated and tested at BNL was shipped to ORNL for the installation of ring half-cell assemblies. Four Ring dipole-quad-corrector (“half-cell”) assemblies (#16 - 19) have been delivered to ORNL.
- In an attempt to understand the failure of BNL-built beam-current-monitor electronics boards at ORNL, the diagnostics group has installed a unit at the A-10 house at AGS/Booster to test the survival under operating machine environment. So far, the unit has survived the test for three weeks. A brain-storming internal review that was held at BNL was unable to resolve the problem.
- New ORNL safety concerns may require a redesign effort affecting BNL equipment near the Ring-to-Target interface region. These concerns may result in a change to the doublet magnet assembly.
- Two critical magnets in the ring injection stripping-foil region (chicane magnet #2 and #3) were mounted on a common stand for an integrated measurement of the magnetic fields. In addition to long-coil integrated measurement, point-coil measurement is also planned to confirm the angle of magnetic field guiding the stripped electrons.
- The cost dispute between the vendor for the 21-cm ID quadrupole magnets and BNL has been turned over to BNL’s Procurement & Legal Departments. The last eight 21Q40 quadrupoles out of a total order of 32, originally planned to be shipped to ORNL, are still held at the vendor’s site.
- One of the terminating resistor rings in the first production pulse-forming network of the extraction system was found to be cracked. The second unit will be shipped to BNL instead of directly to ORNL for further tests and consistency checks.
- Assembly and testing of the injection kicker magnets is near completion. Assembly of the extraction kicker magnets is underway.

Assessment/Issues:

No issues to report.

Performance and Milestones:

	Jan04	Cum-to-Date
BCWS	-775	98,777
BCWP	1,648	99,134
ACWP	1,457	98,309
CV	191	825
SV	2,423	357
Cost Performance Indicators		
CPI	1.13	1.01
SPI	-2.13	1.00
Budget and Completion		
Budget at Complete		118,504
Planned % Complete		83.4%
Actual % Complete		83.7%



Cost Performance :

Cause and Impact: The cumulative cost variance is being investigated.

Corrective Action: A detailed assessment is being performed to understand these variances and corrections will be made as necessary.

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

Schedule Performance :

Cause and Impact: As with the cost variance, the positive schedule variance is being investigated. It is largely due to receipt of material that was not planned until June 04.

Corrective Action: A detailed assessment is being performed.



Welding of the chimney to the core vessel

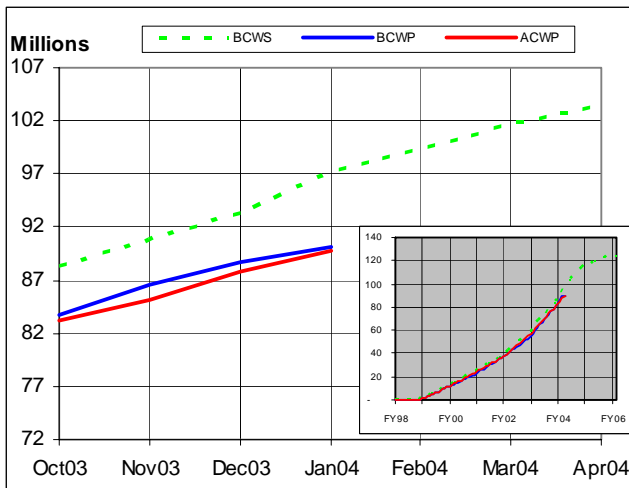
Highlights:

- The Upper Support Cylinder has been installed and installation of the chimney shield rings is underway. The inner target cart liner has been placed into position and welded, completing the connection between the hot cell liner and the core vessel. The lower half of the water supply and return lines to the core vessel have been welded and radiographed.
- The RTBT flight tube was leak tested at the vendor and the total integrated leak was well below the limit in the specification. The flight tube (with its associated shielding) will be delivered to the site.
- The Target Utility Heavy Water Vault support re-design package for Pump Room 4 in the Target Building basement was issued.
- The vessel insert handling tool has successfully completed initial testing. Video cameras have been added, making full remote handling tests in February possible. Final assembly of the hot cell telemanipulator system has begun at the vendor.
- Three proposals for the Ring Injection Dump Beam Stop were received and are under evaluation and a pre-bid conference was conducted for prospective vendors of the mercury target module.
- A trip was made to the vendor to discuss fabrication and welding issues associated with the Inner Reflector Plug and Moderators. Subsequent trips will likely be made to some of the key subcontractors associated with this contract.

Assessment/ Issues:

The installation schedule continues to be monitored closely. SNS is working with the contractor to ensure that parallel activities and/or double shifts are utilized where practical to reduce the total duration.

Performance and Milestones:



	Jan04	Cum-to-Date
BCWS	3,818	97,194
BCWP	1,426	90,194
ACWP	1,881	89,707
CV	-455	488
SV	-2,393	-6,999
CPI		
	0.76	1.01
SPI		
	0.37	0.93
Budget at Complete		124,682
Planned % Complete		78.0%
Actual % Complete		72.3%

Cost Performance:

Cause and Impact: None required

Corrective Action: None required

Schedule Performance:

Cause and Impact: The schedule variance is caused by a number of cases in which the baseline does not reflect contracted performance/ delivery milestones agreed upon in the procurement contract as well as by “true” late activities in which the baseline correctly represents the original plan but the work being accomplished is behind schedule.

Corrective Action: A PCR will be performed that updates the baseline to the current information, both in terms of cost and schedule. At this time, none of these delays impact the critical path defined by the Hot Cell installation sequence.

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



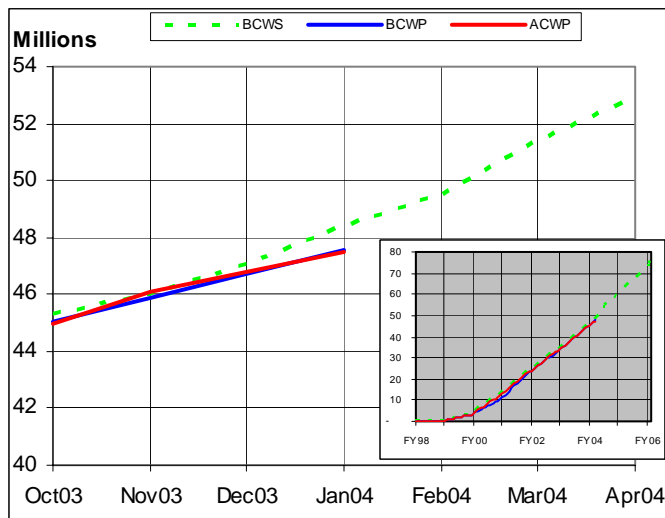
Backscattering Building Construction

Highlights:

- Production schematics for the backscattering preamps and the Data Acquisition System read-out controller board have been completed.
- Opportunities for collaboration with local companies in the development of rugged super-conducting magnets are being pursued.
- Instrument Systems is participating in a joint proposal for the development and construction of a compensated high-field magnet for use at SNS and HFIR.
- Tests have verified that the SNS cryo/furnace meets its temperature range specification (2 – 600 K), but is displaying poor temperature control behavior in its present operating configuration. The various operating conditions are being investigated and an automated flow-valve option has been implemented to improve control.
- Hardware procurements for the detector test station at HFIR have begun.

Assessment/ Issues: No issues at this time. On schedule for the start of instrument installation in March 2004.

Performance and Milestones:



	Jan04	Cum-to-Date
BCWS	1,343	48,391
BCWP	790	47,539
ACWP	708	47,466
CV	82	73
SV	-553	-852
CPI		
	1.12	1.00
SPI		
	0.59	0.98
Budget at Complete		
		80,036
Planned % Complete		
		60.5%
Actual % Complete		
		59.4%

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

Cost Performance:

Cause and Impact: None required
Corrective Action: None required

Schedule Performance:

Cause and Impact: The current period cost variance is due to delayed neutron guide deliveries by Swiss Neutronics.
Corrective Action: These deliveries are not on the critical path and an updated delivery schedule will be incorporated into the baseline.



Target Building Construction

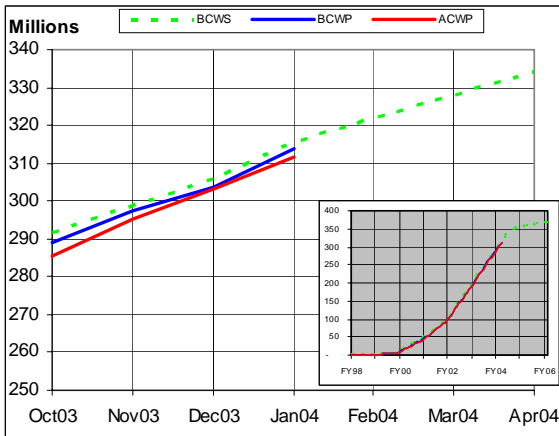
Highlights:

- Construction of the East and West Makeup Air Buildings and Ring Injection Dump is continuing. A Request for Equitable Adjustment, which will extend the completion date of the Ring Injection Dump to March 2004, has been received and is under review.
- Due to settlement issues, some of the RTBT Tunnel work is being deferred/de-scoped from existing contracts.
- Ongoing work in the Target Building includes forming of the Hot Cell walls with concurrent layout of rebar and imbeds as well as concrete patching and rub of the east end of the Hot Cell in preparation for liner plate covering. Roofing continues ahead of the siding installation, working from north to south. All construction trades are progressing in the basement level and south side instrument level areas.
- Elevated slab placements and slabs on grade have been completed for the CLO General Construction and fireproofing, piping, HVAC Ductwork, electrical conduit and cable tray installation and stud wall installation continue. Siding, roofing and glass installation is also underway.
- The Instrumentation and Controls subcontractor continues testing and labeling of fiber optic cable and installation of the fiber optic backbone to the Ring Service Building and Booster Pump.
- The Fire Alarm System is being installed in the Central Lab and Office Building.

Assessment/ Issues:

The critical milestones allowing start of Hot Cell installation in April 2004 and occupancy of the CLO in June 2004 are being closely monitored at all levels within the project. The settlement of the RTBT tunnel continues to be monitored closely to determine if any corrective action is necessary.

Performance and Milestones:



	Jan04	Cum-to-Date
BCWS	9,490	315,435
BCWP	10,242	313,832
ACWP	8,014	311,409
CV	2,228	2,422
SV	752	-1,603
CPI	1.28	1.01
SPI	1.08	0.99
Budget at Complete		370,152
Planned % Complete		85.2%
Actual % Complete		84.8%

Cost Performance:

Cause and Impact: The current period cost variance is due to the fact that the progress on the Target General Construction Contract had been understated and this was corrected this month. The cumulative cost variance is due to contractual issues with the structural steel.

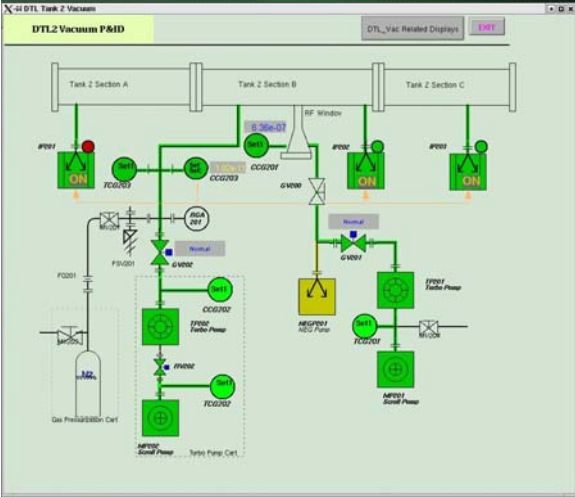
Corrective Action: None required.

Schedule Performance:

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

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



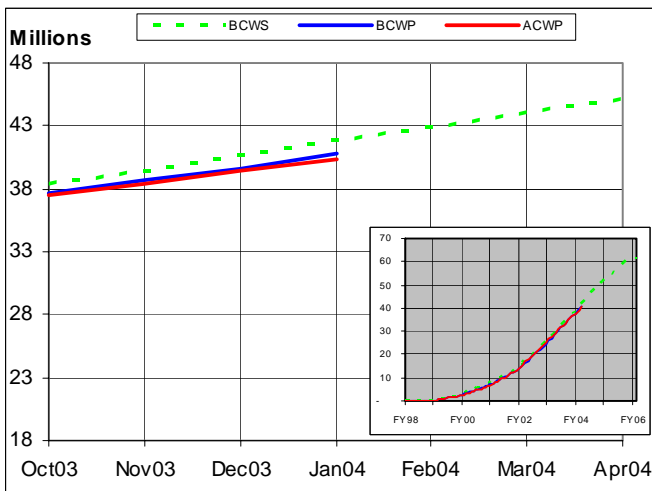
Vacuum control wiring and software function were verified by DTL-2 and DTL-5

Highlights:

- All software under development at BNL is now running under EPICS v3.14. A LINUX-based IOC application that supports field measurement of the ring reference dipole magnet and the interface to devices used to provide the fine timing needed for the extraction kicker Pulse Forming Networks (PFNs) have been created and tested.
- In collaboration with the operations team, the existing Human-Machine Interface (HMI) standard was updated with a view to standardizing operational screens and screen navigation. This in response to lessons learned from earlier runs. The primary addition is a definition of summary process variables (PVs) which will facilitate the development of overview and summary screens. Also in response to lessons learned, the handling of latched machine protection (MPS) faults was re-evaluated. The new design reduces the number of required button pushes. This change has been completed and the improved system is being tested.
- 64 utility modules have been successfully tested at BNL and will be shipped to ORNL. Orders have also been placed for the Yokogawa function generators and the DAC modules used for the MPS trip level in the BLM system.
- Installation of cryogenic control system cables from the Klystron Building to the Linac tunnel has started. DCS fabrication of the PLC and IOC racks for the High Beta cryomodules is complete.
- Preparation for upcoming runs continues. Fiber Optic cabling between controllers and interface modules was completed for the DTL power supply system.
- Cable block diagrams and cable pull lists were completed for all of SCL vacuum controls, and the Ring Vacuum Controls test plan was updated.

Assessment/Issues: No issues at this time.

Performance and Milestones:



	Jan04	Cum-to-Date
BCWS	1,122	41,839
BCWP	1,234	40,833
ACWP	924	40,353
CV	310	481
SV	113	-1,006
CPI	1.34	1.01
SPI	1.10	0.98
Budget at Complete		61,337
Planned % Complete		68.2%
Actual % Complete		66.6%

Cost Performance:

Cause and Impact: The cost variance is largely due to efficiencies in the Ring controls area.

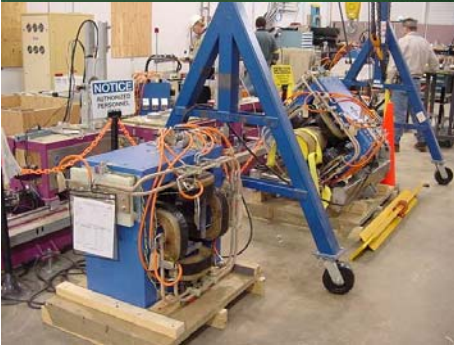
Corrective Action: The entire controls plan is under review and a PCR will be implemented that adjusts all profiles to be consistent with the allocated budget.

Schedule Performance:

Cause and Impact: The schedule variance is largely due to deliberately delayed procurement activities in the Ring controls area.

Corrective Action: The entire controls plan is under review and a PCR will be implemented that adjusts all profiles to be consistent with the allocated budget.

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



Magnet Testing in the Klystron Building

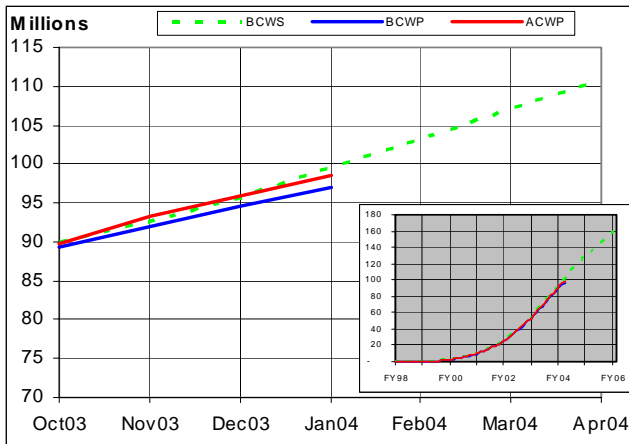
Highlights:

- A 96-hour endurance test of the H⁻ ion source was completed. A steady current of 46 mA, more than the baseline value, was achieved with 1 ms pulses at 10 Hz.
- Coupled cavity RF module one has been installed and vacuum tested. The water cooling and vacuum systems are being completed.
- Six medium-beta cryomodules have been received from JLAB and installed in the tunnel.
- All magnet cables for the ring from the HEBT Service Building and Ring Service Building have been pulled, allowing the installation of half-cells. Nineteen ring half-cells have been shipped to Oak Ridge.
- The subcontract for production of the High-Power Protection Module (HPM) and Field Control Module (FCM), 500 fully assembled printed circuit boards, was awarded to the vendor that produced the prototypes during the development of these systems. In addition, the subcontract for production of the SCL down conversion/distribution chassis, 50 dual-station fully assembled chassis, was issued.

Assessment/ Issues:

Deliveries of CCL and superconducting Linac components are being closely monitored to determine potential impacts on installation and commissioning activities. In the event that the CHL full operation is delayed, either as a result of the leaks in the feedthroughs or the damaged (in shipment) compressors, alternate plans are being developed to ensure accelerator commissioning is not delayed.

Performance and Milestones:



	Jan04	Cum-to-Date
BCWS	3,938	99,678
BCWP	2,349	96,953
ACWP	2,638	98,500
CV	-289	-1,547
SV	-1,589	-2,725
CPI		
CPI	0.89	0.98
SPI		
SPI	0.60	0.97
Budget at Complete		
Budget at Complete		170,243
Planned % Complete		
Planned % Complete		58.6%
Actual % Complete		
Actual % Complete		56.9%

Cost Performance:

Cause and Impact: The cumulative cost variance is due to klystron replumbing, DTL recovery, transfer line leaks, cryomodule production issues, CHL compressor skids manufacturing problems and HEBT dipole stands relocation and regrouping.

Corrective Action: An ETC is currently underway and sources of efficiencies that can offset this overrun are being pursued.

Schedule Performance:

Cause and Impact: The cumulative schedule variance is largely due to late deliveries of the DTL drift tubes as well as CCL1. Cryomodules are also running approximately 1 month behind plan.

Corrective Action: A re-planning of the DTL 4, 5, 6 and CCL 1, 2, and 3 detailed installation sequence was completed That new plan maintains the dates of the project's commissioning sequence.

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	Jan-06



CLO lobby

Highlights:

- The Safety Evaluation Report (SER) on the Preliminary Safety Analysis Update Report identified a concern with changing building codes. A meeting with ES&H, CF, and Target staff was held to discuss the issue and a study is underway to identify the differences between the codes and the impact these changes may have on the anchors used for equipment. Preliminary results indicate that the differences in the requirements of the two different codes are relatively minor. Potential impacts will be determined upon completion of the study. Modifications to Revision 1 of the Preliminary Safety Documentation for the Target Facility are underway. The SNS Cryogenic Safety requirements have been consolidated and the draft document is undergoing internal evaluation.
- Staff from the ORNL Fire Department evaluated the Target Hot Cell construction area to evaluate emergency response techniques that might be required in the area.
- Dimensional requirements of the DTL # 4 Post Couplers have been validated by the SNS Metrology. DTL tubes # 4, 5, and 6 will soon follow.
- A Quality Source Surveillance was held at the vendor supplying the Target Systems Mercury/Water Heat Exchanger. The test results that were witnessed were considered to be positive.
- An assessment to determine the cause of the damage related to the 2K Cold Box delivery is underway. Although all indications suggest shipping damage, it is not sure how and where the damage occurred (the components moved from France to JLAB, to RATS I, then RATS II).
- The draft Software Quality Assurance (SQA) Plan is being reviewed.
- Preparations for the June 2004 move to the partially completed CLO are continuing. Existing furniture has been inventoried, new furniture requirements have been identified, control room furniture selection is underway, copiers and other equipment move requirements have been identified, room numbering has been completed, the determination of room occupancy is underway and the move budget and schedule have been developed.

Assessment/Issues:

Managing within budget. Continuing strong focus on cost control and contingency management. The transition of work from LANL to ORNL in April 2004 is going well.

External Review Data:

No additional progress on recommendations from external reviews was made in January.

Review	Recommendations	Closed This Month	Open Actions
DOE SC Review (11/03)	24	0	22
DOE End Game Review (7/03)	5	0	2
DOE SC Review (5/03)	29	0	4

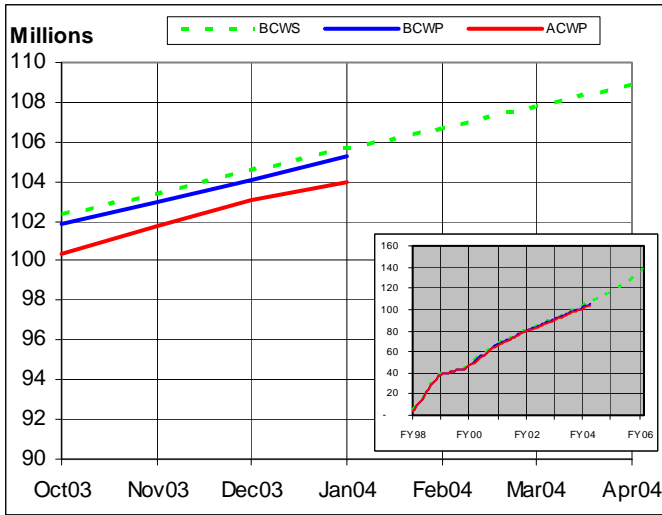
Life of Project Market Experience:

Major Awards (\$M)	Baseline Estimate (\$M)	Baseline Savings (\$M)	Percent savings over baseline
541.9	508.1	-33.8	-6.6%

Through February 23, 2004: 97% of the major procurements already awarded.



Performance:



	Jan04	Cum-to-Date
BCWS	1,092	105,644
BCWP	1,130	105,227
ACWP	902	103,952
CV	228	1,275
SV	38	-417
<hr/>		
CPI	1.25	1.01
SPI	1.03	1.00
<hr/>		
BAC (1.2)		75,603
BAC (1.10.3, 1.1.13, 1.10.5)		71,128
<hr/>		
Planned % Complete		72.0%
Actual % Complete		71.7%

Cost Performance:

Cause and Impact: The cost variance is largely due to improper phasing of move costs. The latter should have been isolated to June 2004 and rather was spread across FY04.

Corrective Action: A PCR will be implemented to correct the move plan in the baseline.

Schedule Performance:

Cause and Impact: None required

Corrective Action: None required

Milestones:

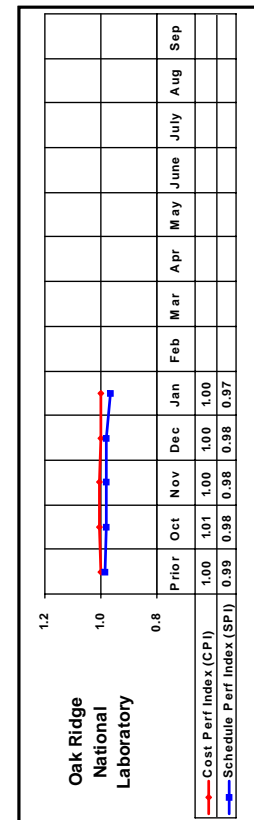
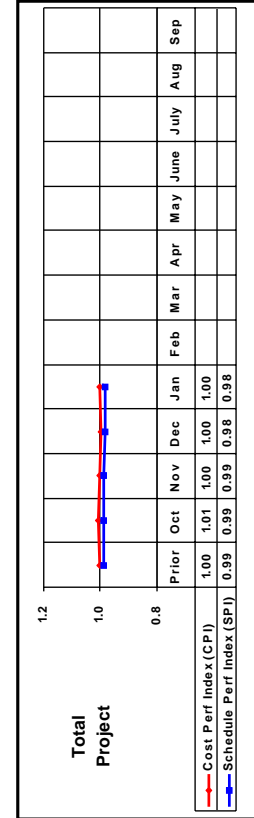
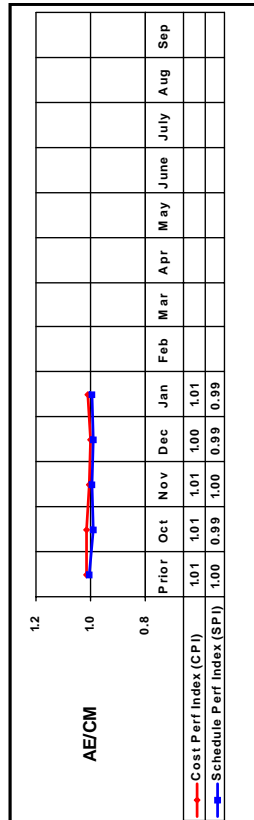
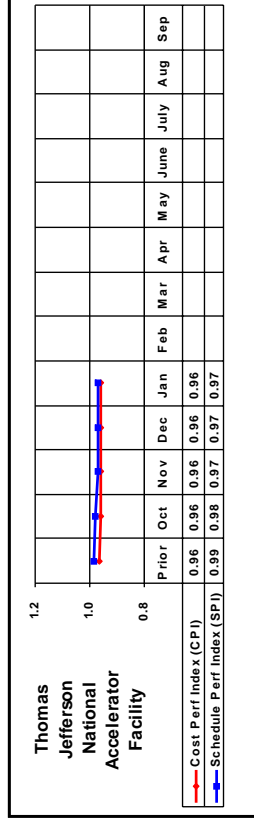
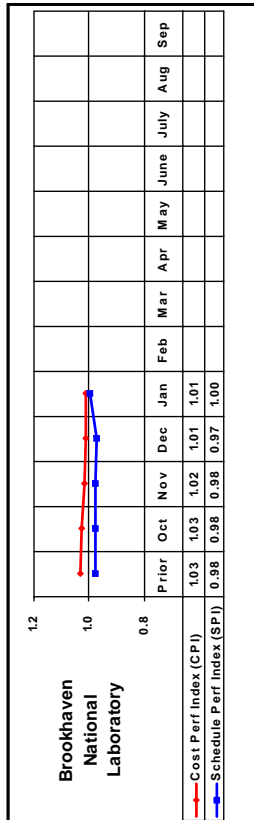
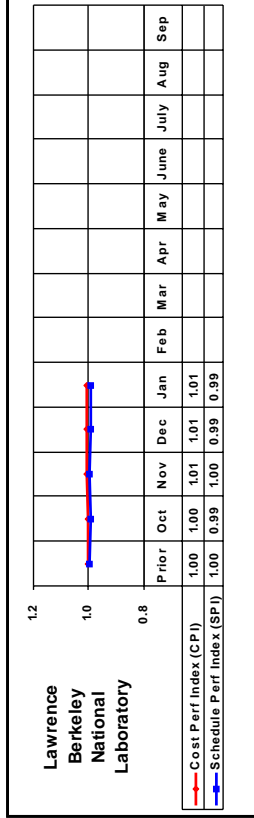
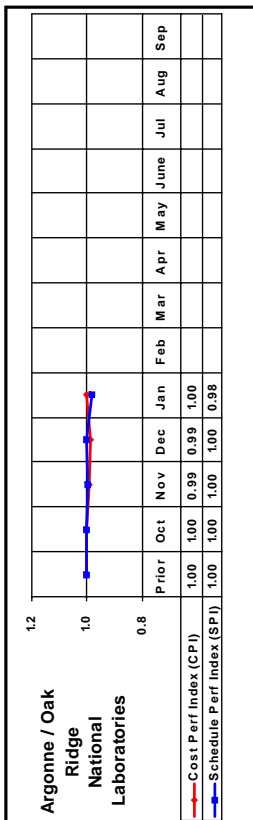
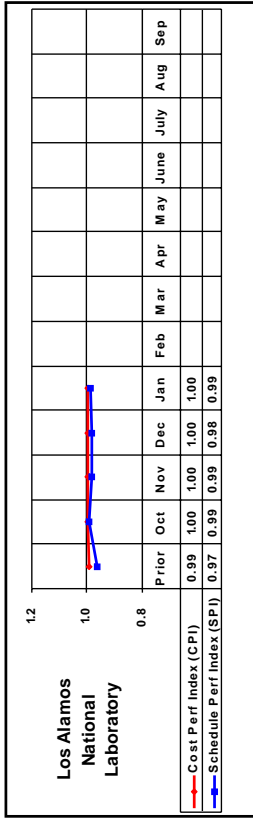
Description	Milestone Date	Forecast Date
EIS ROD	Jun-99	Jun-99 ✓
PSAR Issued for Approval	Dec-99	Dec-99 ✓
Submit PSAR to DOE for Approval	Dec-99	Dec-99 ✓
PSAD issued for Information	Sep-00	Sep-00 ✓
Issue FSAD for approval (Front End and Linac)	Sep-02	Aug-02 ✓
Issue FSAD for approval (Ring and Transfer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



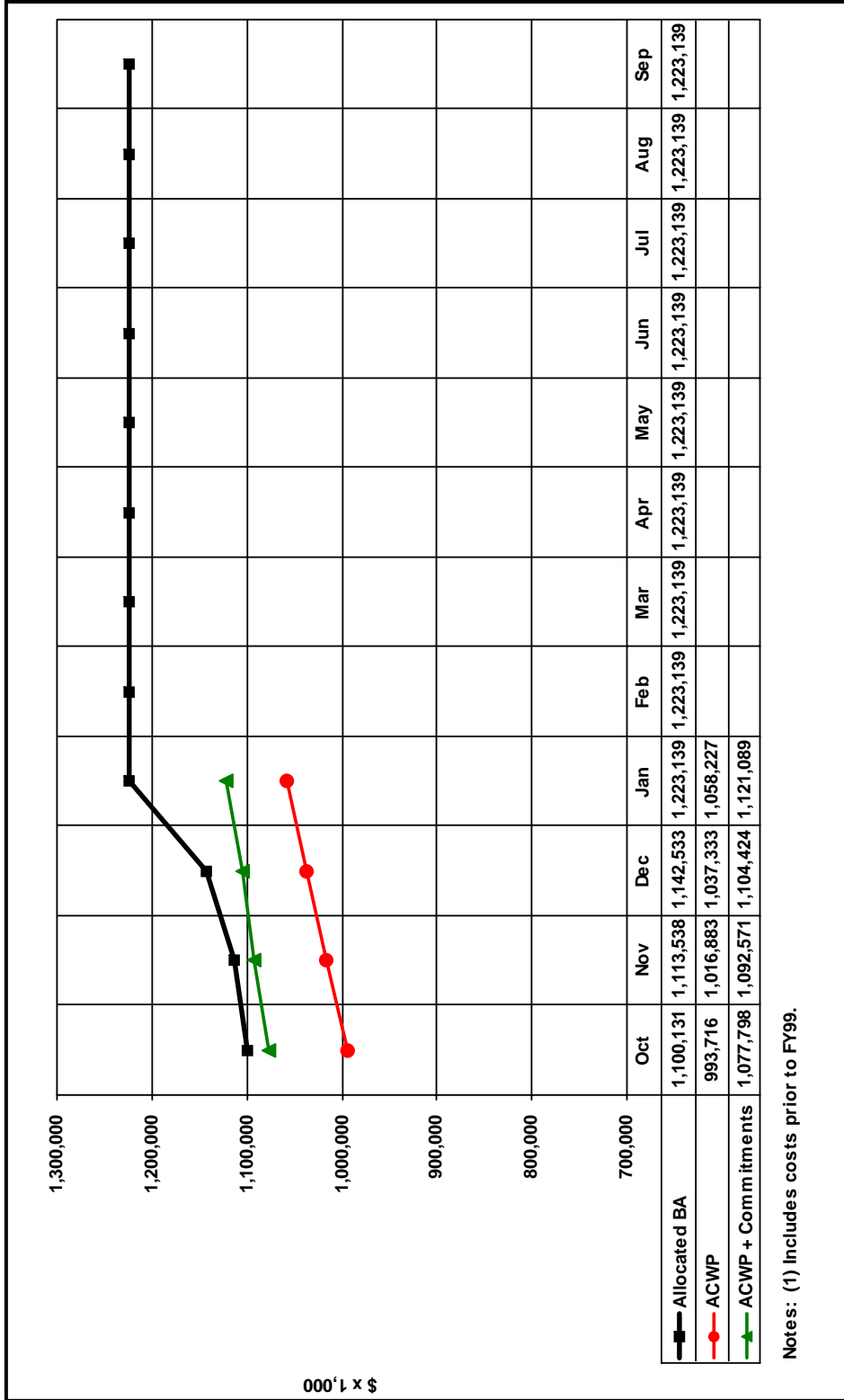


Overall Project Performance is stable





TPC Obligation Profile against BA



Phase funded procurements at the end of January could obligate an additional \$45.8 M, raising the total obligation potential to \$1,166M.



PROJECT TITLE:	REPORTING PERIOD:										PROJECT NUMBER:				
	Spallation Neutron Source Project										99-E-334				
	January 01, 2004 through January 31, 2004										START DATE: October 1998				
PARTICIPANT NAME AND ADDRESS:	BCWS PLAN DATE:										COMPLETION DATE:				
	Oak Ridge National Laboratory										June 2006				
	Oak Ridge, TN										January 2004				
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	PERF	WORK SCHED	PERF	SCHED	COST	WORK SCHED	PERF	WORK SCHED	PERF	SCHED	COST			
1.02 Project Support	755.1	755.1	576.0	576.0	0.0	179.2	62,113.3	62,113.3	61,027.6	61,027.6	(0.0)	1,085.7	75,603	75,103	500
1.03 Front End Systems	0.0	0.0	20.0	20.0	0.0	(20.0)	20,832.0	20,832.0	20,907.7	20,907.7	0.0	(75.7)	20,832	20,832	0
1.04 Linac Systems	5,447.8	4,577.1	5,830.8	5,830.8	(870.7)	(1,253.7)	271,383.7	271,383.7	276,568.1	276,568.1	(7,503.0)	(5,184.4)	314,671	316,423	-1,752
1.05 Ring & Transfer System	(280.9)	2,104.0	1,948.0	1,948.0	2,384.8	156.0	107,948.2	108,701.8	107,643.7	107,643.7	753.6	1,058.1	141,241	141,898	-657
1.06 Target Systems	3,818.4	1,425.9	1,881.6	1,881.6	(2,392.6)	(455.7)	79,038.8	72,039.7	71,551.7	71,551.7	(6,999.2)	487.9	106,527	110,415	-3,888
1.07 Instrument Systems	1,214.5	676.5	565.8	565.8	(638.0)	110.7	34,760.8	33,911.2	33,658.5	33,658.5	(849.6)	252.7	63,321	63,371	-50
1.08 Conventional Facilities	9,490.2	10,241.8	8,014.1	8,014.1	751.5	2,227.7	315,435.0	313,831.8	311,409.3	311,409.3	(1,603.2)	2,422.5	370,152	379,250	-9,098
1.09 Integrated Control Systems	1,121.6	1,234.4	924.0	924.0	112.7	310.4	40,134.6	39,129.1	38,648.4	38,648.4	(1,005.5)	480.7	59,632	59,732	-100
LINE ITEM SUBTOTAL	21,566.8	21,014.7	19,760.2	19,760.2	(552.1)	1,254.6	939,149.4	921,942.6	921,415.1	921,415.1	(17,206.8)	527.4	1,151,980	1,167,025	-15,045
CONTINGENCY													40,720	25,675	15,045
TOTAL LINE ITEM	21,566.8	21,014.7	19,760.2	19,760.2	(552.1)	1,254.6	939,149.4	921,942.6	921,415.1	921,415.1	(17,206.8)	527.4	1,192,700	1,192,700	0
1.01 Research & Development	128.3	113.6	142.3	142.3	(14.7)	(28.7)	98,789.2	98,786.4	99,040.0	99,040.0	(2.8)	(253.6)	101,874	101,874	0
1.10 Operations	1,386.1	1,423.9	991.7	991.7	37.8	432.3	39,242.7	38,825.2	37,771.8	37,771.8	(417.4)	1,053.4	117,126	117,126	0
OTHER PROJECT COSTS SUBTOTAL	1,514.4	1,537.6	1,134.0	1,134.0	23.1	403.6	138,031.9	137,611.6	136,811.8	136,811.8	(420.2)	799.9	219,000	219,000	0
TOTAL PROJECT COST	23,081.3	22,552.3	20,894.2	20,894.2	(529.0)	1,658.2	1,077,181.3	1,059,554.2	1,058,226.9	1,058,226.9	(17,627.1)	1,327.3	1,411,700	1,411,700	0
RECONCILIATION TO CONTRACT BUDGET BASE															
DOLLARS EXPRESSED IN: Thousands													DATE: February 18, 2004		



PROJECT TITLE:	REPORTING PERIOD:												PROJECT NUMBER:					
	January 01, 2004 through January 31, 2004												99-E-334					
	PARTICIPANT NAME AND ADDRESS: Oak Ridge National Laboratory Oak Ridge, TN												START DATE: October 1998					
BCWS PLAN DATE: January 2004												COMPLETION DATE: June 2006						
ITEM	CURRENT PERIOD						CUMULATIVE TO DATE						AT COMPLETION					
	BUDGETED COST			ACTUAL COST			BUDGETED COST			ACTUAL COST			BUDGET	ESTIMATE (EAC)	VARIANCE			
	WORK SCHED	WORK PERF	PERF	WORK SCHED	WORK PERF	PERF	WORK SCHED	WORK PERF	PERF	WORK SCHED	WORK PERF	PERF	WORK SCHED	WORK PERF	PERF			
AE/CM	9,490.2	10,241.8	8,014.1	751.5	2,227.7	313,831.8	315,435.0	47,558.7	311,409.3	-1,603.2	2,422.5	370,152	379,250	80,106	80,106	379,250	379,250	(9,098)
Argonne National Laboratory / ORNL	1,342.8	790.2	708.4	-552.7	81.8	47,558.7	48,410.9	47,558.7	47,486.0	-852.2	72.8	80,056	80,106	80,056	80,106	80,106	80,106	(50)
Brookhaven National Laboratory	-539.7	1,861.4	1,647.2	2,401.1	214.2	105,968.5	106,264.2	105,968.5	104,539.2	-295.8	1,429.2	128,710	129,108	128,710	129,108	129,108	129,108	(398)
Thomas Jefferson Laboratory	773.8	698.9	970.3	-74.8	-271.4	60,670.9	62,505.0	60,670.9	63,310.9	-1,834.2	-2,640.0	66,044	67,199	66,044	67,199	67,199	67,199	(1,155)
Los Alamos National Laboratory	2,202.8	3,064.9	3,582.3	862.1	-517.3	183,692.2	185,763.9	183,692.2	184,405.9	-2,071.8	-713.8	197,960	198,017	197,960	198,017	198,017	198,017	(57)
Lawrence Berkeley National Laboratory	79.7	65.3	55.1	-14.4	10.2	28,388.1	28,555.7	28,388.1	28,223.8	-167.5	164.4	29,663	29,663	29,663	29,663	29,663	29,663	0
Oak Ridge National Laboratory	9,731.7	5,829.8	5,916.9	-3,901.9	-87.1	319,444.0	330,246.5	319,444.0	318,851.8	-10,802.5	592.2	498,395	502,682	498,395	502,682	502,682	502,682	(4,287)
WBS SUBTOTAL	23,081.3	22,552.3	20,894.2	(528.0)	1,658.2	1,059,554.2	1,077,181.3	1,059,554.2	1,058,226.9	(17,627.1)	1,327.3	1,370,980	1,386,025	1,370,980	1,386,025	1,386,025	1,386,025	(15,045)
CONTINGENCY												40,720	25,675	40,720	25,675	25,675	25,675	15,045
TOTAL PROJECT COST	23,081.3	22,552.3	20,894.2	(528.0)	1,658.2	1,059,554.2	1,077,181.3	1,059,554.2	1,058,226.9	(17,627.1)	1,327.3	1,411,700	1,411,700	1,411,700	1,411,700	1,411,700	1,411,700	0
RECONCILIATION TO CONTRACT BUDGET BASE																		
DOLLARS EXPRESSED IN: Thousands												DATE: February 18, 2004						



PROJECT TITLE:	REPORTING PERIOD:												PROJECT NUMBER:			
	Spallation Neutron Source Project January 01, 2004 through January 31, 2004												99-E-334			
PARTICIPANT NAME AND ADDRESS:	BCWS PLAN DATE:												START DATE:		COMPLETION DATE:	
	Oak Ridge National Laboratory Oak Ridge, TN January 2004												October 1998		June 2006	
ITEM	BCWS CUM TO DATE	BUDGETED COST FOR WORK SCHEDULED (NON - CUMULATIVE)												FY Total	Out Years	Budget at Completion
		FISCAL YEAR														
		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	83,655	1,147,963
1.02 Project Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.03 Front End Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.04 Linac Systems	-	-	-	-	183	475	581	174	-	-	-	-	(8)	1,405	(0)	1,405
1.05 Ring & Transfer System	-	-	-	-	(1,695)	16	18	17	76	(448)	226	79	7	(1,703)	1,703	-
1.06 Target Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.07 Instrument Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.08 Conventional Facilities	-	-	-	-	109	(912)	(368)	236	1,447	568	(132)	(73)	(76)	800	1,812	2,612
1.09 Integrated Control Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL AUTHORIZED CHANGES	-	-	-	-	(1,403)	(421)	232	427	1,523	121	94	6	(76)	501	3,516	4,017
PM BASELINE (END OF PERIOD)	862,169	23,755	18,636	18,917	21,120	16,252	19,051	16,550	13,960	19,569	11,618	12,399	10,813	202,640	87,171	1,151,980
RECONCILIATION TO CONTRACT BUDGET BASE																
DOLLARS EXPRESSED IN: Thousands																
DATE: February 18, 2004																

Project Change Requests implemented in January are as follows:

PCR Number	Description	Actual Cost Impact
AS-04-002	Transfer of Costs from 1.4.7.10 to 1.4.1.1	-
CF-04-001	Subcontractor Requests for Equitable Adjustment	2,612
LI-04-009	Replace JLAB Solenoid	-
LI-04-008	Transfer Budget to ORNL for ACCEL Contract	-
RI-04-004	Pending Change Orders	-
AS-04-003	FY04 Work Package Realignment	-
	Dollar-Euro Exchange Rate for ACCEL CCL Fab	1,405



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) — $TEC + OPC$