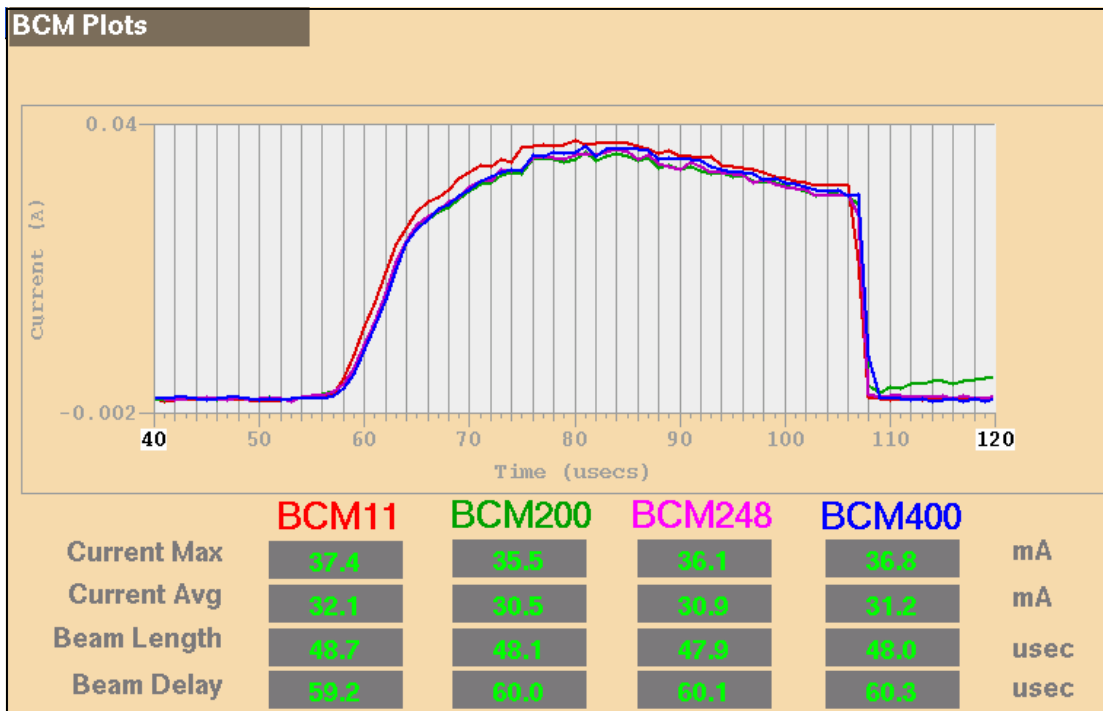


The Spallation Neutron Source Monthly Report

March 2004



Beam Control Monitors show successful beam transport through Drift Tube Tanks 1-3





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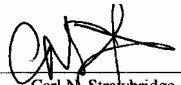


Project Overview and Assessment



Inside the Target Hot Cell

| | |
|------------------------------|--------------|
| Technical Assessment: | Satisfactory |
| Cost Assessment: | Satisfactory |
| Schedule Assessment: | Satisfactory |
| Overall Assessment: | Satisfactory |


 Carl N. Straybridge
 SNS Deputy Project Director
 5/6/04
 Date

Highlights and Issues:

- Good project performance continues with minor cumulative cost and schedule variances of 0.4% and -7% respectively against the March 2006 early finish schedule. Through the end of March, 79.5% of the project is complete. Completion percentages are:
 - ◊ 99 % of R&D
 - ◊ 94 % of design
 - ◊ 75 % of technical hardware (including procurement and fabrication)
 - ◊ 86 % of conventional construction
 - ◊ 50 % of installation
- Contingency continues to be tight. The available contingency balance of \$27.2M will be reduced to \$25.3M 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 20 March 2004, the total Project has worked in excess of 5.1 million hours with 61 recordable injuries (an increase of 1 from last month) and no lost work day (away) cases.
- Management focus continues on maintaining the Target installation schedule.
- Due to FY04 BA constraints, work priorities are being closely managed. Some selected slow-downs could be directed if necessary.
- Instrument installation began in March.
- The LANL hand-off occurred on schedule on April 2nd.

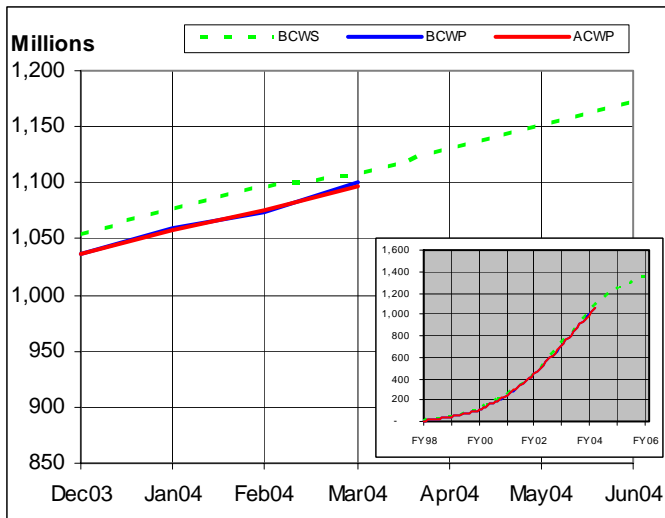
Assessment:

Accelerator Systems Division (ASD): Drift Tube Linac (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 13. The Ion Source and DTL RF performed superbly and 38 mA of beam was transported with nearly 100% transmission and essentially no use of steering was required. The Beam Loss Monitor system was further developed as well with many significant measurements and calibrations taken. The results are currently being analyzed. Coupled Cavity Linac (CCL-1) RF conditioning has begun. The quads have been installed and the power supply tests are ready to begin. 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 and CCL-4 is being prepared for shipment from ACCEL. The warm helium compressors have been purging the 4.5K cold box of impurities and it is now within acceptable limits. The turbine filters will be cleaned, the expanders installed and then commissioning of the 4.5K cold box will continue. The vendor for the 2.1K cold compressor connectors has been able to produce a connector that will meet the requirements of the cold compressors and is developing a production and installation schedule for these connectors. Input power couplers are being tested in the ORNL RF Test Facility 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.

Experimental Systems Division (XFD): Equipment deliveries and installation activities continue on the site. The installation of Target Systems equipment continues. All ten of the lower interstitial blocks and outer guide rails on the south side of the target monolith have been installed and installation of the lower interstitial blocks and outer guide rails on the north side is proceeding. The first of the large boxes that form the Proton Beam Window (PBW) insert as well as three more shielding blocks that surround the PBW have also been installed. The contract for the fabrication of the hot cell floor shielding has been awarded and the Target Utility cooling water rupture disks and electric

heater were delivered. These items will be provided to the General Contractor for installation in the piping spools. The fabrication of the mercury loop piping and pipe supports is complete and the components are being packaged for shipment. The neutron guides for the backscattering spectrometer have been delivered to the site. Vendor discussions on the sample stage for the liquids reflectometer have begun. The schedule for installation of the core vessel inserts for the un-instrumented beamlines is being accelerated now that the inserts have been received.

Conventional Facilities (CF): Work on the west CLO parking lot lighting and paving is proceeding. The punch list items from the Ring Construction contract are being reviewed in preparation for closing out that contract. Backfill over the RTBT tunnel is progressing but has been delayed by weather. The geotechnical report of the investigation of soil properties beneath the RTBT is being reviewed. The preliminary conclusion is that there are no conditions beneath the RTBT that would invalidate model settlement projections. Thus far, incremental settlement after placing additional material has been minimal. Target construction work continues. The south instrument level utility trench piping has been installed and pressure tested. Erection of the structural steel for the helium compressor building is complete and decking for the building, and stairs, rails and other components for the compressor and the Target buildings has arrived on site. The RFE milestone to begin equipment installation inside the hot cell was met with the installation of the crane rails inside the hot cell on April 8, 2004. Installation of the stainless steel liner is on schedule for completion in May and the floor of the mercury piping pit was completed. Installation of the 50T crane is still proceeding; however issues with the electrical buss are preventing its completion and full operation. The crane must be operational to install equipment in the hot cell. The failure of the hinge pin for the hot cell shielded door was discussed with the vendor. It is believed that the pin failed due to an improper series of heat treatments. A new forging will be fabricated and subjected to an alternate heat treat process. Additional QA documentation will verify the integrity of this process and ensure the pin is undamaged. Work in the CLO is still proceeding well in support of partial occupancy in June.



| Total Project | Mar04 | Cum-to-Date |
|---------------------------|--------|-------------|
| BCWS | 11,604 | 1,107,886 |
| BCWP | 26,584 | 1,100,608 |
| ACWP | 21,065 | 1,096,417 |
| CV | 5,519 | 4,190 |
| SV | 14,980 | -7,279 |
| | | |
| CPI | 1.26 | 1.00 |
| SPI | 2.29 | 0.99 |
| | | |
| Budget at Complete | | 1,384,498 |
| | | |
| Contingency | | 27,203 |
| | | |
| Total Project Cost | | 1,411,700 |

| | |
|--|--------------------|
| Total Project Cost (TPC) | \$1,411.7 M |
| Percent planned (cumulative) | 80% |
| Percent complete (cumulative) | 79.5% |
| Total Estimated Cost (TEC) | \$1,192.7 M |
| Cost and Commitments through 3/31/04 | \$1,017M |
| Outstanding Phase Funded Awards | \$31.1M |
| Budget to Complete | \$148.1M |
| Contingency | \$27.2M |
| Estimate at Completion | \$ 1,167.4M |
| Remaining Contingency Based on EAC (20.8%) | \$ 25.3M |

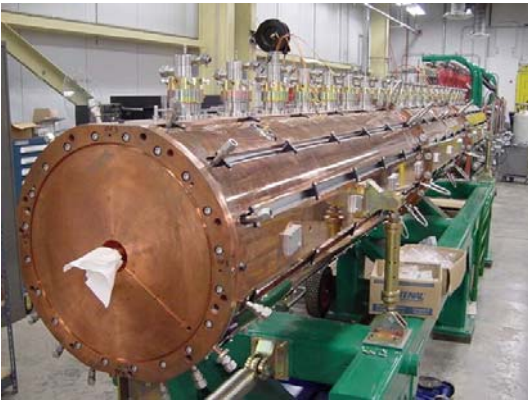
Critical Path:

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, 23 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 |



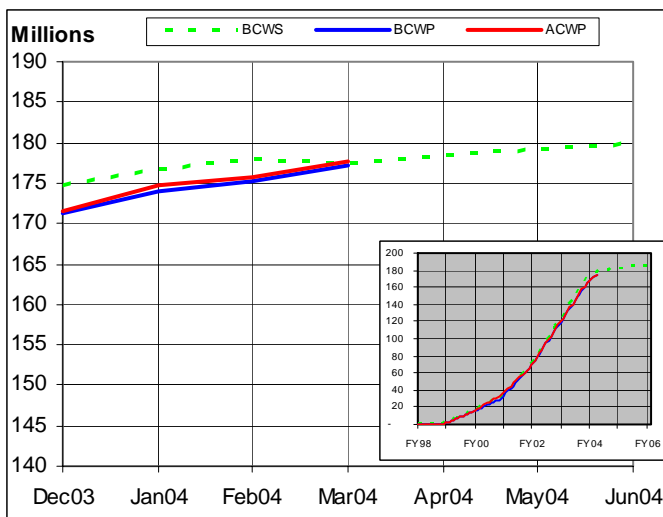
DTL Tank 6

Highlights:

- Site acceptance tests of the second 5-MW (CCL) klystron and a 5-MW circulator have been completed and they have been shipped to ORNL. Testing of the third 5-MW klystron has begun.
- Three 550-kW (SCL) Thales klystrons have been received and modifications of one of the HVCMs were completed. Site acceptance tests of these tubes has begun.
- Three 550-kW (SCL) CPI klystrons were shipped to ORNL and factory tests of several more klystrons were completed. The CPI contract has been novated to ORNL.
- The re-build of the prototype HVCM is complete and it has been placed in service for high-power RF testing. Several improvements have been made to both LANL HVCMs to improve reliability.
- The final DTL drift tube was repaired, tested, and shipped to ORNL. Tanks-5 and -6 slug tuners and Tanks-4 and -5 post couplers were completed and shipped.
- CCL Module 3 was final tuned and prepared for shipping. ACCEL completed CCL Module-4 fabrication and mounted it on the stand for tuning.
- Fabrication of all BPM electronics chassis is complete and most of them have been shipped to ORNL. A few remain to be final tested and shipped.
- All CCL wire-scanner actuators and all wire-scanner electronics have been shipped to ORNL.
- The dedicated SNS Division at LANL was disestablished at the end of March and remaining personnel and linac work have been transitioned to the LANSCE Division.

Assessment/ Issues: None at this time.

Performance and Milestones:



| | Mar04 | Cum-to-Date |
|---------------------------|-------|-------------|
| BCWS | -519 | 177,482 |
| BCWP | 1,891 | 177,093 |
| ACWP | 2,019 | 177,688 |
| CV | -129 | -595 |
| SV | 2,409 | -389 |
| CPI | | |
| | 0.94 | 1.00 |
| SPI | | |
| | -3.65 | 1.00 |
| Budget at Complete | | 183,448 |
| Planned % Complete | | 96.7% |
| Actual % Complete | | 96.5% |

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

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

Schedule Performance :
Cause and Impact: The current period schedule variance is due to the fact that the klystron contracts were novated to ORNL and therefore, the schedule variance associated with these late deliveries has been eliminated. These deliveries are now part of the ASD baseline.
Corrective Action: None required.



Linac Systems– Thomas Jefferson National Accelerator Facility



String assembly for cryomodule High-β 1

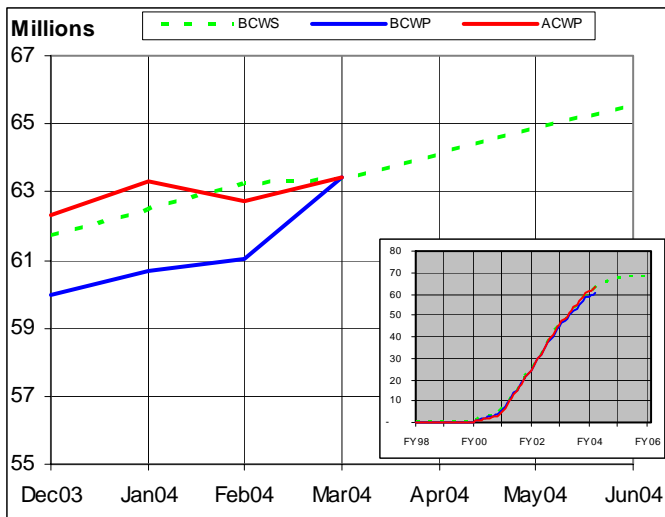
Highlights:

- Four additional High-β cavities were qualified this month.
- String assembly for cryomodule H-1 was completed.
- Assembly of cryomodules M-9, M-10 and M-11 was completed.
- Assembly of Cryomodule H-1 was started.

Assessment/ Issues:

Problems with the high pressure rinse pump(s) and the RF power supply system have been resolved and both systems are functioning properly.

Performance and Milestones:



| | Mar04 | Cum-to-Date |
|---------------------------|-------|-------------|
| BCWS | 91 | 63,373 |
| BCWP | 2,386 | 63,425 |
| ACWP | 741 | 63,457 |
| CV | 1,644 | -32 |
| SV | 2,295 | 51 |
| CPI | | |
| | 3.22 | 1.00 |
| SPI | | |
| | 26.32 | 1.00 |
| Budget at Complete | | 68,358 |
| Planned % Complete | | 92.7% |
| Actual % Complete | | 92.8% |

Cost Performance:

Cause and Impact: The ETC PCR was implemented this month, bringing current variances in line.
Corrective Action: None required.

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

Schedule Performance:

Cause and Impact: The ETC PCR was implemented this month, bringing current variances in line.
Corrective Action: None required.



BPM Setup at ORNL

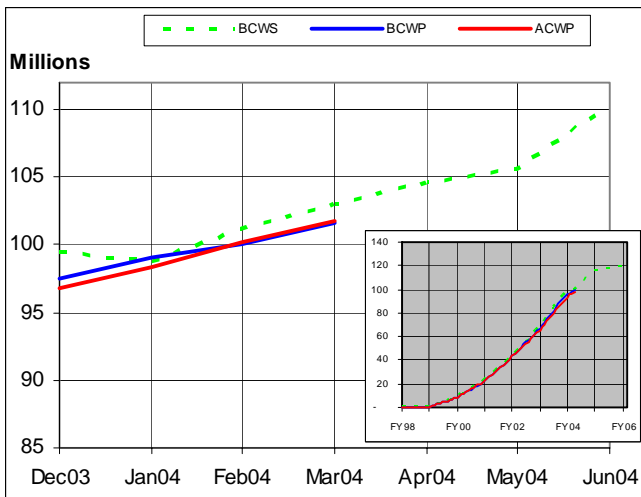
Highlights:

- The prototype unit of the Beam Position Monitor (BPM) electronics boards was successfully tested during the DTL commissioning.
- Installation drawings for the RF straight section have been completed and those for the Collimation, Injection and Extraction straight sections are in progress.
- Space at BNL has been allocated for the integrated testing of the injection straight section elements.
- Both BNL and ORNL power supply groups participated in an acceptance test of the main dipole PS at the vendor. Problems with power supply regulation and missing/misused parts were identified and another test is scheduled in about one month.
- A third TiN coating station was established to coat the inner surfaces of the extraction kicker modules. This coating will suppress the build-up of electron clouds.
- Tests of the beam-current-monitor electronics boards continued. While no failures were observed when noise (spikes, or surges) was injected into the power leads, failures did occur when an electrostatic discharge of 9 kV was applied to the wideband and filtered amplifier outputs.
- The RF system dynamic tuning power supplies were found to be unstable during testing at the vendor. Power supplies for all four dynamic tuning circuits will be fully tested and corrected.
- All four ring "quarter-cell" assemblies have been delivered to ORNL.
- More detailed modeling of radio-activation levels near ring-to-target interface due to back-shine from the target, and in the injection area due to the back-shine from the ring injection dump will be performed to fully replicate the actual hardware placement and shielding geometry.
- Two critical magnets in the ring injection stripping-foil region (chicane magnet #2 and #3) have been mounted on a common stand to permit integrated measurement of the magnetic fields. Point-coil measurements were performed to confirm the angle of magnetic field guiding the stripped electrons and the 6 mr difference between the calculated and measured angle is within the tolerance of the electron catcher.

Assessment/Issues:

Agreement on the "BNL/ORNL" transition has been reached and the implementation plan began in April.

Performance and Milestones:



| | Mar04 | Cum-to-Date |
|---------------------------|-------|-------------|
| BCWS | 1,866 | 103,012 |
| BCWP | 1,526 | 101,585 |
| ACWP | 1,686 | 101,822 |
| CV | -159 | -236 |
| SV | -340 | -1,427 |
| CPI | | |
| | 0.91 | 1.00 |
| SPI | | |
| | 0.82 | 0.99 |
| Budget at Complete | | 118,925 |
| Planned % Complete | | 86.6% |
| Actual % Complete | | 85.4% |

Cost Performance :

Cause and Impact: None required.

Corrective Action: None required.

Schedule Performance :

Cause and Impact: The schedule variance is dispersed amongst several WBS elements with the largest schedule variance being associated with Ring diagnostics. This effort has been re-planned and a PCR is in process.

Corrective Action: The diagnostics effort will be re-planned in a forthcoming PCR.

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



Target Systems– Oak Ridge National Lab



Target monolith showing shielding blocks and inner guide rails

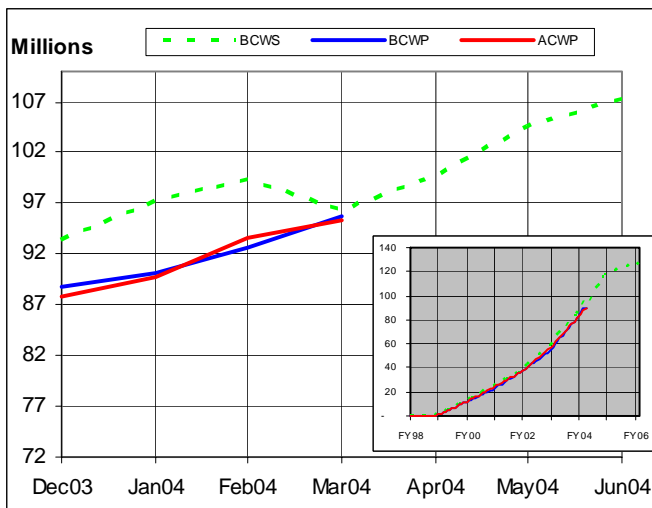
Highlights:

- The first of 20 upper interstitial blocks and the first (of eleven) single channel shutter gate were both received at the site.
- Four of the lower interstitial blocks and the associated shutter outer guide rails were installed, along with three more shield blocks that surround the proton beam window, the six remaining inner guide rails and the final blocks that form the forward stack of shielding around and above the target cart.
- The vessel insert stud tensioning tool was successfully tested. It is now ready for use during initial installation of the core vessel inserts.
- The flight tube was connected to the PBW bellows assembly and the leak test of the cefilac clamp between the flight tube and the PBW bellows assembly was successfully completed.
- The last Target Utility support re-design package was issued. This last package addressed supports in Pump Room 1 as well as fixes to supports in Pump Rooms 2, 3 and 4. It is anticipated that subsequent support problems will be addressed via RFI's on a case-by-case basis.
- The pedestal manipulator hydraulic positioner was delivered to the vendor for final assembly with the servomanipulators. The ORNL telemanipulator was successfully operated on the portable manipulator system at the vendor.
- The survey data for the target rails in the target port has been received. They are located within 0.008" of the nominal position.
- The fabrication of the mercury loop piping and pipe supports is complete and the components are being packaged for shipment. The final data package has been submitted and is being reviewed. The specification and drawings of the hot cell floor shielding were approved and issued for procurement and the Hg Target container contract was awarded.

Assessment/ Issues:

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

Performance and Milestones:



| | Mar04 | Cum-to-Date |
|---------------------------|--------|-------------|
| BCWS | -3,098 | 96,259 |
| BCWP | 3,097 | 95,813 |
| ACWP | 1,696 | 95,280 |
| CV | 1,401 | 534 |
| SV | 6,196 | -445 |
| CPI | | |
| | 1.83 | 1.01 |
| SPI | | |
| | -1.00 | 1.00 |
| Budget at Complete | | 126,310 |
| Planned % Complete | | 76.2% |
| Actual % Complete | | 75.9% |

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

Cost Performance:

Cause and Impact: The ETC PCR was implemented this month, bringing current variances in line.

Corrective Action: None required.

Schedule Performance:

Cause and Impact: The ETC PCR was implemented this month, bringing current variances in line. The current schedule variance is due to delays with the Target Utilities installation package.

Corrective Action: This package is being watched closely to ensure that the critical path is not impacted.



Instrument Systems– Argonne and Oak Ridge National Labs



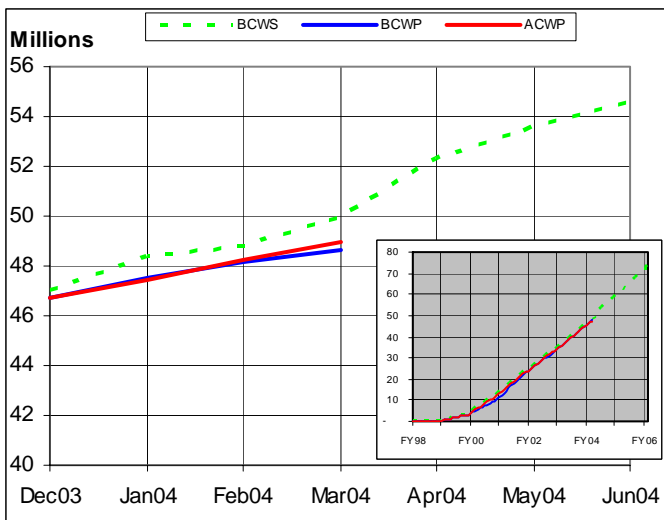
Backscattering spectrometer under test at IPNS

Highlights:

- The first neutron science experiment using an SNS sample environment device was carried out at HFIR, where an SNS cryofurnace was used on the HB-1a instrument to study a martensitic transformation in an RhFe alloy.
- The SNS Instrument Safety Committee was formed and has met.
- Prototype sample changer for rapid changing of samples in cryogenic environments was assembled and tested at the HFIR cryo-lab in collaboration with SBIR partners.
- The scattering tank for the backscattering spectrometer has been installed on site.
- The project plan for the development of the 90 degree scintillator module for the Powder and Engineering Instruments has been prepared.
- A prototype detector for the SANS instrument, based on a multi-tube design, has been tested. While its performance was satisfactory, it failed after being bumped slightly. More robust designs are under development.
- Progress and quality-assurance procedures on the guides for the two reflectometers were reviewed during a vendor visit.
- A series of meetings to develop an organizational structure appropriate to the full range of technical activities needed to support the operation of the neutron scattering instruments has begun.
- The blank core vessel inserts for un-instrumented beamlines have been received.

Assessment/Issues: No issues at this time.

Performance and Milestones:



| | Mar04 | Cum-to-Date |
|---------------------------|-------|-------------|
| BCWS | 1,153 | 49,974 |
| BCWP | 512 | 48,644 |
| ACWP | 683 | 48,931 |
| CV | -171 | -287 |
| SV | -641 | -1,329 |
| CPI | | |
| | 0.75 | 0.99 |
| SPI | | |
| | 0.44 | 0.97 |
| Budget at Complete | | |
| | | 78,121 |
| Planned % Complete | | |
| | | 64.0% |
| Actual % Complete | | |
| | | 62.3% |

Cost Performance:

Cause and Impact: The current period and cumulative cost variances are due to erroneous charges in the 1.1.8 WBS element. This will be corrected in April.

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 and a delay in detector effort for the SANS instrument. 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 |



CLO to Target Bridge

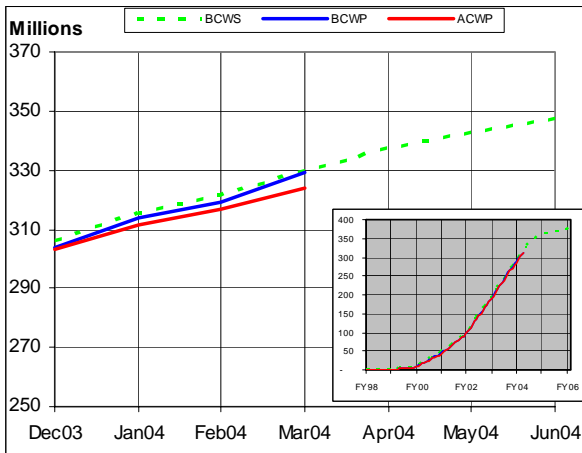
Highlights:

- Construction of the East and West Makeup Air Buildings and Ring Injection Dump has been completed.
- RTBT settlement issues are being actively evaluated. Confirmation of the settlement, with the RTPT now loaded, will continue. If model predictions continue to agree with physical measurements through the end of June, then no significant remediation efforts will be required.
- Concrete placements for the construction of Hot Cell North & South gallery walls and delay tank cavity continued in the Target Building. The Hot Cell stainless steel liner plate coverings are in process on multiple shifts and work is continuing on fire protection sprinkler system piping, general piping systems, electrical systems, building siding, windows and roofing.
- Construction of the CLO to Target bridge continues.
- The installation of overhead doors has been completed at the loading dock area and progress continues with drywall installation, mechanical and electrical installation and installation of siding and windows.
- The Instrumentation and Controls subcontractor has completed all work currently authorized.
- Installation of the Fire Alarm System in the CLO Building is continuing.
- The Paving Subcontractor has successfully completed all current scope and the estimate for paving the West CLO parking lot was prepared.

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:



| | Mar04 | Cum-to-Date |
|---------------------------|--------|-------------|
| BCWS | 8,347 | 329,970 |
| BCWP | 10,176 | 329,065 |
| ACWP | 6,953 | 323,780 |
| CV | 3,223 | 5,285 |
| SV | 1,830 | -904 |
| CPI | | |
| | 1.46 | 1.02 |
| SPI | | |
| | 1.22 | 1.00 |
| Budget at Complete | | 378,912 |
| Planned % Complete | | 87.1% |
| Actual % Complete | | 86.8% |

Cost Performance:

Cause and Impact: The cumulative positive cost variance is largely due to contractual issues with the structural steel. The current period variances are largely due to implementation of several project change requests.

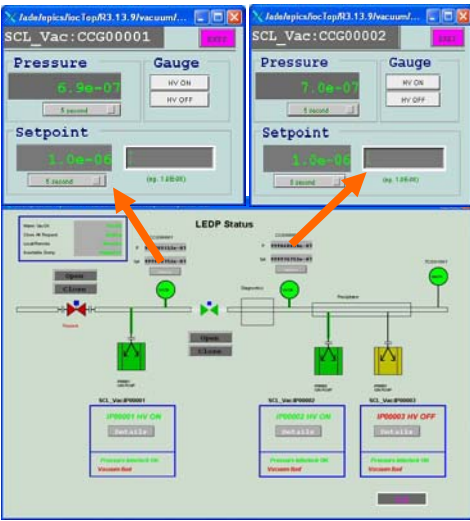
Corrective Action: The contractual issues with the steel are being worked.

Schedule Performance:

Cause and Impact: The current period variances are largely due to implementation of several project change requests that aligned the baseline with current work plans. The largest contributor to the schedule variance is due to the incorporation of approved field changes in the Utility Building baseline without compensating earned value.

Corrective Action: The earned value will be corrected in April.

| 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 |



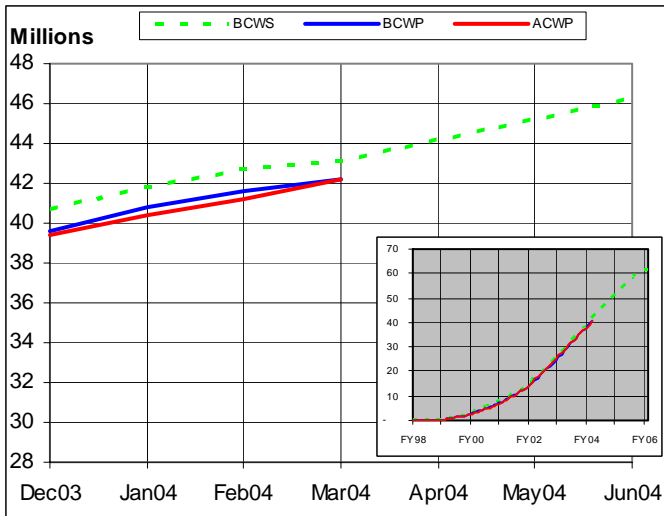
SCL Vacuum Control test

Highlights:

- The remaining 1.9 scope at LANL and the final handover strategy is now documented and understood on both sides. Because almost all this subsystem work is complete, all remaining work at LANL will be reported under a single level 4 WBS. A similar list of final deliverables has been prepared for the Ring Controls in preparation for their handoff in the future.
- All subsystems required for the DTL 1-3 run were completed and test plans executed. The Personnel Safety System was recertified as configured for this run (PPS Phase 0.4a). Phase 1 “lite,” required for conditioning of CCL1 was also certified.
- Systems have been put in place for conditioning of CCL1. The vacuum, RCCS and Quadrupole Magnet Cooling Systems (QMCS) were installed and tested. Integrated system test procedures were formulated and executed. Electrical installation and a complete checkout of the PLC systems was performed.
- Testing of control equipment for the first SCL vacuum control rack began. This equipment serves the Low Energy Differential Pumping (LEDP) section and the first four cryomodules.
- The Cryo Control System was also tested and ready for the turn-on of the 4K cold box. Improvements were made to the design of the EPICS record group that provides cooldown and warmup sequences for the 4K coldbox, and these sequences were successfully tested using simulated data. All 9 of the Central Helium Liquefier Building PLC processors were successfully upgraded. The ODH system for the CHL is complete and the final integration test has been performed.
- The Front End Test Stand completed a long and successful run made possible in large measure by the implementation of EPICS control. Operation of the test stand could be monitored remotely and all parameters were archived, which helped with “post-mortem” analysis of various events during the run.
- Work continued on the IOC standardization effort with more IOCs now running under EPICS v3.14.4.

Assessment/Issues: No issues at this time.

Performance and Milestones:



| | Mar04 | Cum-to-Date |
|---------------------------|-------|-------------|
| BCWS | 367 | 43,110 |
| BCWP | 633 | 42,185 |
| ACWP | 1,006 | 42,225 |
| CV | -373 | -40 |
| SV | 266 | -925 |
| <hr/> | | |
| CPI | 0.63 | 1.00 |
| SPI | 1.72 | 0.98 |
| <hr/> | | |
| Budget at Complete | | 61,449 |
| <hr/> | | |
| Planned % Complete | | 70.2% |
| Actual % Complete | | 68.7% |

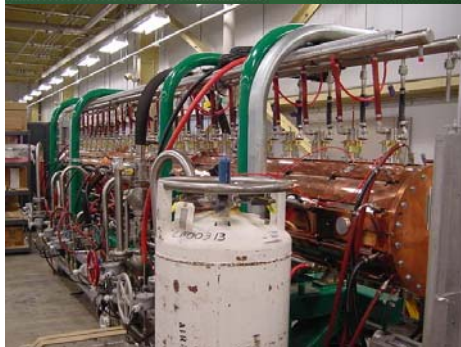
Cost Performance:

Cause and Impact: The current period variances are due to a PCR that was processed to align the baseline to the BA authorization.
Corrective Action: None required.

Schedule Performance:

Cause and Impact: The schedule variance is largely 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 |



DTL Tank 5

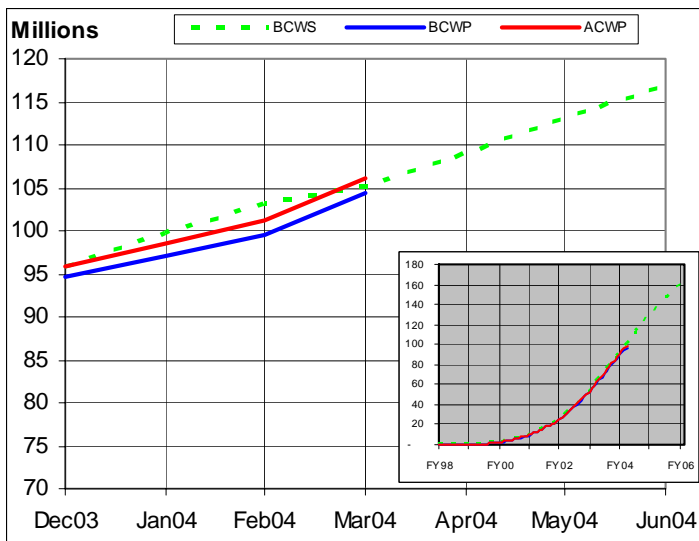
Highlights:

- DTL tanks 1-3 have been installed and easily conditioned up to a 25% over voltage at a 2% duty factor. All the drift tubes have been tested and installed in DTL tanks 4-6.
- A very successful run was completed on the ion source hot spare stand of 33 net days of operation, 25 were at the full 6% duty cycle. Initially the average pulse current often exceeded 40 mA but decreased to roughly 35 mA after the cesiations became less effective. After successful debugging, the source often ran for several days without a single trip.
- CCL module 1 has been assembled and tested. All 12 intersegment quads have been installed and one powered to test the PS. RF conditioning began in April. CCL module 2 has been assembled and is ready for vacuum checking.
- All Ring arc quarter cells have been delivered to ORNL and production has restarted on the remaining 8 half cells and 24 half cells have been delivered.
- Three LANL workers in the RF area are working at ORNL as part of the LANL post-SNS-Division MOU.

Assessment/ Issues:

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

Performance and Milestones:



| | Mar04 | Cum-to-Date |
|---------------------------|-------|-------------|
| BCWS | 1,910 | 105,139 |
| BCWP | 4,900 | 104,345 |
| ACWP | 4,729 | 105,983 |
| CV | 171 | -1,638 |
| SV | 2,990 | -793 |
| CPI | 1.04 | 0.98 |
| SPI | 2.57 | 0.99 |
| Budget at Complete | | 173,110 |
| Planned % Complete | | 60.7% |
| Actual % Complete | | 60.3% |

Cost Performance:

Cause and Impact: 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. In addition, the EAC has also been increased.

Schedule Performance:

Cause and Impact: The current month schedule variance is due to implementation of a PCR that rephased the delivery of the Klystron spares as well as a number of behind-schedule activities that were completed this month.
Corrective Action: None required.

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



CLO Construction

Highlights:

- Approximately 450 visitors attended the annual SNS Open House on April 2, 2004. Through displays and demonstrations, SNS scientists and managers provided business and community leaders, as well as interested residents, with a better understanding of SNS’s research potential.
- Planning for the move to the CLO in June continues. Each division has had a briefing on the move and the schedule of events and a detailed “Moving Guide” is being prepared.
- Detailed BA planning for the remainder of FY04 continues.
- The consolidation of the Project Support and Conventional Facilities Site Support organizations is complete.

Assessment/Issues:

Managing within budget. Continuing strong focus on BA management, cost control and contingency management. The transition of work from LANL to ORNL has been completed. Roll-off plans with JLAB and BNL have been completed and JLAB’s plan was baselined in March as part of their ETC.

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 | 18 | 1 |
| DOE End Game Review (7/03) | 5 | 1 | 0 |
| DOE SC Review (5/03) | 29 | 3 | 1 |

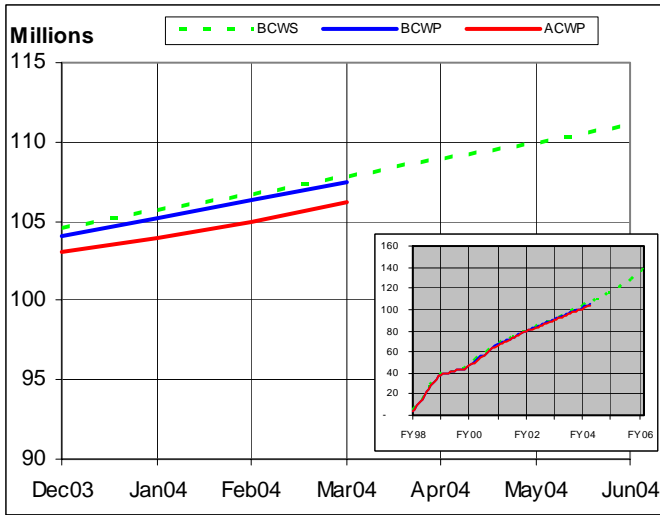
Life of Project Market Experience:

| Major Awards (\$M) | Baseline Estimate (\$M) | Baseline Savings (\$M) | Percent savings over baseline |
|--------------------|-------------------------|------------------------|-------------------------------|
| 546.2 | 509.6 | -36.6 | -7.12% |

Through April 22, 2004: 97% of the major procurements are already awarded.



Performance:



| | Mar04 | Cum-to-Date |
|-------------------------------------|-------|-------------|
| BCWS | 1,117 | 107,818 |
| BCWP | 1,117 | 107,401 |
| ACWP | 1,298 | 106,199 |
| CV | -181 | 1,202 |
| SV | 0 | -417 |
| CPI | | |
| CPI | 0.86 | 1.01 |
| SPI | | |
| SPI | 1.00 | 1.00 |
| BAC (1.2) | | 75,636 |
| BAC (1.10.3, 1.1.13, 1.10.5) | | 71,284 |
| Planned % Complete | | 73.4% |
| Actual % Complete | | 73.1% |

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:

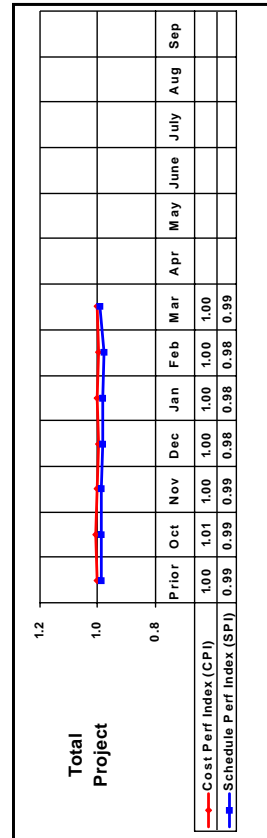
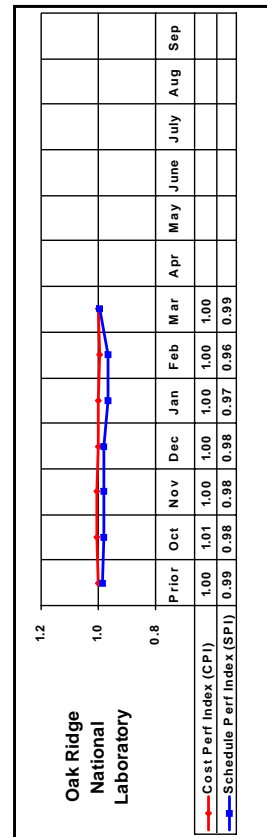
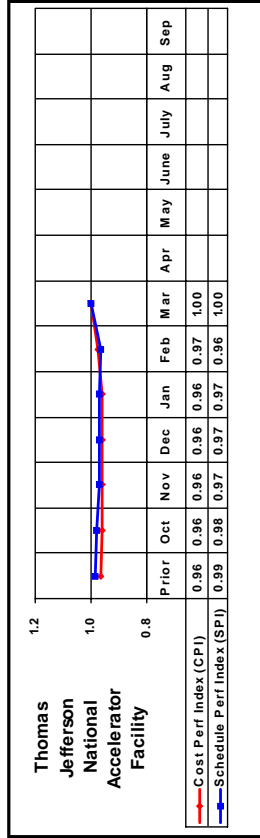
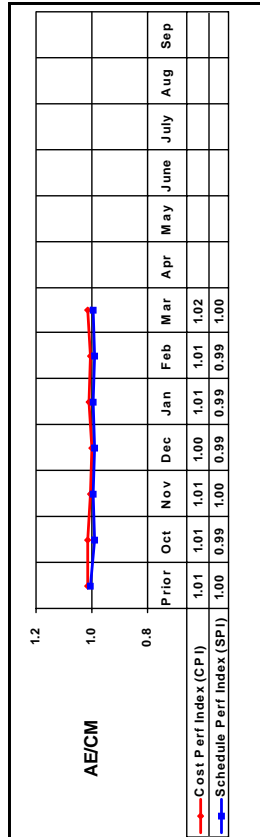
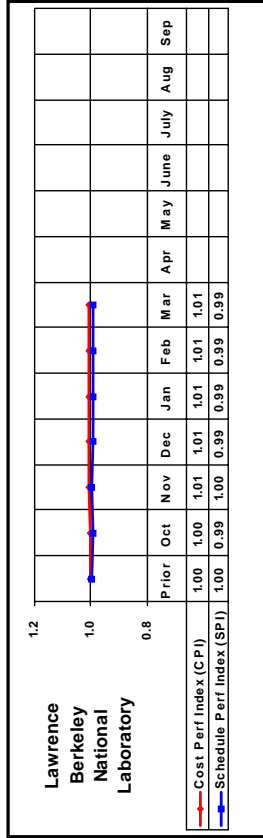
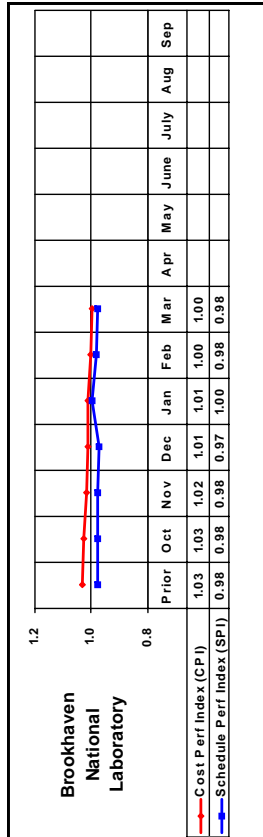
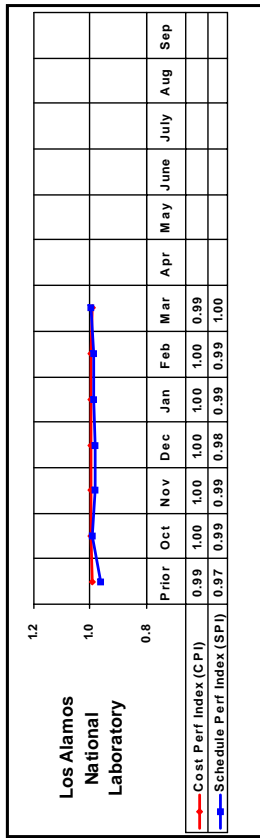
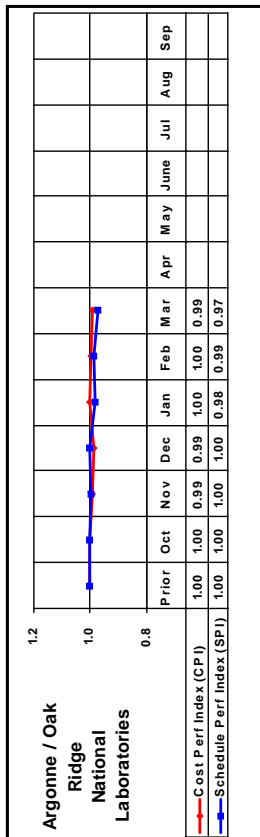
| Description | Milestone Date | Forecast Date |
|--|----------------|---------------|
| EIS ROD | Jun-99 | Jun-99 ✓ |
| PSAR Issued for Approval | Dec-99 | Dec-99 ✓ |
| Submit PSAR to DOE for Approval | Dec-99 | Dec-99 ✓ |
| PSAD issued for Information | Sep-00 | Sep-00 ✓ |
| Issue FSAD for approval (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 atrium



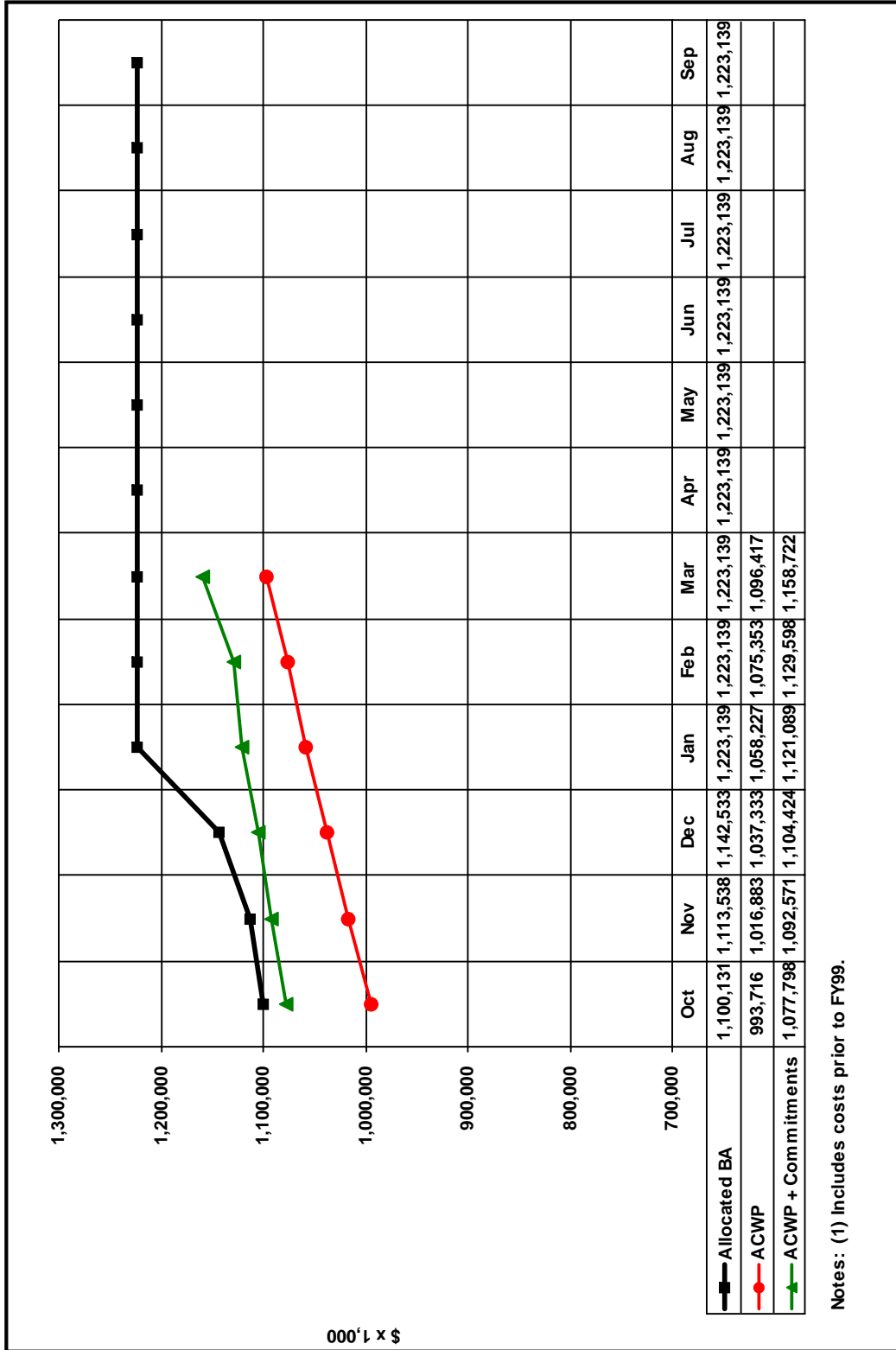


Overall Project Performance is stable





TPC Obligation Profile against BA



Notes: (1) Includes costs prior to FY99.

Phase funded procurements at the end of February could obligate an additional \$31.1 M, raising the total obligation potential to \$1,190M.



| PROJECT TITLE: | REPORTING PERIOD: | | | | | | | | | | PROJECT NUMBER: | | | | | | | | | | |
|---|---|-----------|----------|-------------|-----------|-------------|-------------|-------------|-----------|-----------------------------|--|-----------|-------------|-----------|------|------------|---------------|------|--------------|----------------|----------|
| | March 01, 2004 through March 31, 2004 | | | | | | | | | | 99-E-334 | | | | | | | | | | |
| | PARTICIPANT NAME AND ADDRESS: Oak Ridge National Laboratory Oak Ridge, TN | | | | | | | | | | START DATE: October 1998 COMPLETION DATE: June 2006 | | | | | | | | | | |
| ITEM | CURRENT PERIOD | | | | | | | | | | CUMULATIVE TO DATE | | | | | | AT COMPLETION | | | | |
| | BUDGETED COST | | | ACTUAL COST | | | VARIANCE | | | BUDGETED COST | | | ACTUAL COST | | | VARIANCE | | | BUDGET (BAC) | ESTIMATE (EAC) | VARIANCE |
| | WORK SCHED | WORK PERF | PERF | 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 | | | |
| 1.02 Project Support | 775.5 | 775.5 | 744.5 | 0.0 | 31.0 | 63,633.4 | 63,633.4 | 62,480.3 | (0.0) | 1,153.1 | 75,636 | 75,636 | 75,136 | 500 | | | | | | | |
| 1.03 Front End Systems | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20,832.0 | 20,832.0 | 20,907.7 | 0.0 | (75.7) | 20,832 | 20,832 | 20,832 | 0 | | | | | | | |
| 1.04 Linac Systems | 325.2 | 7,810.4 | 6,182.3 | 7,485.2 | 1,628.1 | 283,738.0 | 282,421.0 | 284,788.2 | (1,317.0) | (2,367.1) | 316,940 | 316,819 | 121 | | | | | | | | |
| 1.05 Ring & Transfer Systems | 2,195.1 | 2,064.3 | 2,152.2 | (130.8) | (87.9) | 112,956.4 | 111,716.0 | 111,965.1 | (1,240.5) | (249.2) | 142,001 | 142,361 | -360 | | | | | | | | |
| 1.06 Target Systems | (3,098.4) | 3,097.4 | 1,696.5 | 6,195.8 | 1,401.0 | 78,104.2 | 77,658.7 | 77,125.4 | (445.5) | 533.3 | 108,155 | 109,006 | -851 | | | | | | | | |
| 1.07 Instrument Systems | 1,074.0 | 599.1 | 568.6 | (474.9) | 30.5 | 36,135.2 | 34,988.3 | 34,951.0 | (1,146.8) | 37.3 | 63,277 | 63,516 | -239 | | | | | | | | |
| 1.08 Conventional Facilities | 8,346.6 | 10,176.4 | 6,953.0 | 1,829.8 | 3,223.3 | 329,969.7 | 329,065.3 | 323,779.9 | (904.3) | 5,285.4 | 378,912 | 379,875 | -963 | | | | | | | | |
| 1.09 Integrated Control Systems | 366.8 | 632.6 | 1,005.6 | 265.8 | (373.0) | 41,405.6 | 40,480.6 | 40,520.5 | (925.0) | (39.9) | 59,745 | 59,845 | -100 | | | | | | | | |
| LINE ITEM SUBTOTAL | 9,984.8 | 25,155.7 | 19,302.7 | 15,171.0 | 5,853.1 | 966,774.4 | 960,795.3 | 956,518.2 | (5,979.1) | 4,277.2 | 1,165,497 | 1,167,389 | -1,892 | | | | | | | | |
| CONTINGENCY | | | | | | | | | | | 27,203 | 25,311 | 1,892 | | | | | | | | |
| TOTAL LINE ITEM | 9,984.8 | 25,155.7 | 19,302.7 | 15,171.0 | 5,853.1 | 966,774.4 | 960,795.3 | 956,518.2 | (5,979.1) | 4,277.2 | 1,192,700 | 1,192,700 | 0 | | | | | | | | |
| 1.01 Research & Development | 76.1 | (90.2) | 114.1 | (166.3) | (204.3) | 98,994.7 | 98,811.9 | 99,212.3 | (182.8) | (400.4) | 100,000 | 100,000 | 0 | | | | | | | | |
| 1.10 Operations | 1,543.2 | 1,518.2 | 1,647.9 | (25.0) | (129.7) | 42,117.1 | 41,000.3 | 40,686.7 | (1,116.7) | 313.6 | 119,000 | 119,000 | 0 | | | | | | | | |
| OTHER PROJECT COSTS SUBTOTAL | 1,619.3 | 1,428.0 | 1,762.0 | (191.3) | (334.0) | 141,111.8 | 139,812.2 | 139,899.0 | (1,299.6) | (86.8) | 219,000 | 219,000 | 0 | | | | | | | | |
| TOTAL PROJECT COST | 11,604.0 | 26,583.7 | 21,064.6 | 14,979.7 | 5,519.1 | 1,107,886.2 | 1,100,607.6 | 1,096,417.2 | (7,278.7) | 4,190.4 | 1,411,700 | 1,411,700 | 0 | | | | | | | | |
| RECONCILIATION TO CONTRACT BUDGET BASE | | | | | | | | | | DATE: March 16, 2004 | | | | | | | | | | | |
| DOLLARS EXPRESSED IN: Thousands | | | | | | | | | | | | | | | | | | | | | |



| PROJECT TITLE: Spallation Neutron Source Project Oak Ridge National Laboratory Oak Ridge, TN | REPORTING PERIOD: March 01, 2004 through March 31, 2004 | | | | | | | | | | PROJECT NUMBER: 99-E-334 | | | | |
|---|---|---------------|------------|-------------|----------|----------|-------------|---------------|-------------|-------------|-----------------------------|-------------------------------|-----------|----------------|----------|
| | PARTICIPANT NAME AND ADDRESS: Oak Ridge National Laboratory Oak Ridge, TN | | | | | | | | | | START DATE: October 1998 | COMPLETION DATE: June 2006 | | | |
| | ITEM | BUDGETED COST | | ACTUAL COST | | VARIANCE | | BUDGETED COST | | ACTUAL COST | | VARIANCE | | AT COMPLETION | |
| WORK SCHED | | WORK PERF | WORK SCHED | WORK PERF | SCHED | COST | WORK SCHED | WORK PERF | WORK SCHED | WORK PERF | SCHED | COST | BUDGET | ESTIMATE (EAC) | VARIANCE |
| AE/CM | 8,346.6 | 10,176.4 | 6,953.0 | 682.7 | 1,829.8 | 3,223.3 | 329,969.7 | 329,065.3 | 323,779.9 | 48,951.2 | (904.3) | 5,285.4 | 378,912 | 379,875 | (963) |
| Argonne National Laboratory / ORNL | 1,152.7 | 511.5 | 1,902.9 | 682.7 | (641.2) | (171.1) | 49,993.4 | 48,663.9 | 48,951.2 | 108,413.5 | (1,329.5) | (287.3) | 78,140 | 78,379 | (239) |
| Brookhaven National Laboratory | 1,871.3 | 1,723.0 | 741.4 | 1,902.9 | (148.3) | (179.9) | 110,581.0 | 108,354.1 | 108,413.5 | 63,456.6 | (2,226.9) | (59.4) | 129,212 | 129,212 | 0 |
| Thomas Jefferson Laboratory | 90.6 | 2,385.7 | 1,662.9 | 741.4 | 2,295.1 | 1,644.3 | 63,373.2 | 63,424.7 | 63,456.6 | 187,896.5 | 51.5 | (31.9) | 68,358 | 68,413 | (55) |
| Los Alamos National Laboratory | (275.5) | 1,662.9 | 2,288.2 | 1,938.4 | 1,938.4 | (625.3) | 187,062.8 | 186,787.2 | 187,896.5 | 28,361.7 | (275.6) | (1,109.3) | 194,927 | 194,927 | 0 |
| Lawrence Berkeley National Laboratory | 75.2 | 79.9 | 66.8 | 66.8 | 4.7 | 13.2 | 28,699.6 | 28,546.7 | 28,361.7 | 335,557.8 | (152.9) | 185.0 | 29,676 | 29,676 | 0 |
| Oak Ridge National Laboratory | 343.2 | 10,044.3 | 8,429.7 | 8,429.7 | 9,701.1 | 1,614.6 | 338,206.5 | 335,765.7 | 335,557.8 | 1,096,417.2 | (2,440.9) | 207.9 | 505,272 | 505,907 | (635) |
| WBS SUBTOTAL | 11,604.0 | 26,583.7 | 21,064.6 | 21,064.6 | 14,979.7 | 5,519.1 | 1,107,886.2 | 1,100,607.6 | 1,096,417.2 | 4,190.4 | (7,278.7) | 4,190.4 | 1,384,497 | 1,386,389 | (1,892) |
| CONTINGENCY | | | | | | | | | | | | | 27,203 | 25,311 | 1,892 |
| TOTAL PROJECT COST | 11,604.0 | 26,583.7 | 21,064.6 | 21,064.6 | 14,979.7 | 5,519.1 | 1,107,886.2 | 1,100,607.6 | 1,096,417.2 | 4,190.4 | (7,278.7) | 4,190.4 | 1,411,700 | 1,411,700 | 0 |
| RECONCILIATION TO CONTRACT BUDGET BASE | | | | | | | | | | | | | | | |
| DOLLARS EXPRESSED IN: Thousands | | | | | | | | | | | | | | | |
| DATE: March 16, 2004 | | | | | | | | | | | | | | | |



| PROJECT TITLE: | REPORTING PERIOD: | | | | | | | | | | | | PROJECT NUMBER: | | | |
|---|---|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|------------------|-----------|----------------------|-----------|
| | Spallation Neutron Source Project | | | | | | | | | | | | 98-E-334 | | | |
| PARTICIPANT NAME AND ADDRESS: | BOWS PLAN DATE: | | | | | | | | | | | | START DATE: | | | |
| | Oak Ridge National Laboratory Oak Ridge, TN | | | | | | | | | | | | March 2004 | | October 1998 | |
| ITEM | BUDGETED COST FOR WORK SCHEDULED (NON - CUMULATIVE) | | | | | | | | | | | | COMPLETION DATE: | | | |
| | FISCAL YEAR | | | | | | | | | | | | June 2006 | | | |
| 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 | 23,755 | 18,636 | 18,917 | 22,523 | 16,673 | 18,819 | 16,123 | 12,437 | 19,449 | 11,524 | 12,383 | 10,890 | 202,139 | 87,672 | 1,151,980 |
| 1.02 Project Support | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 27 | 33 |
| 1.03 Front End Systems | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.04 Linac Systems | 0 | - | - | - | - | - | (4,578) | 19 | 1,462 | 997 | 1,356 | 642 | 583 | 482 | 1,788 | 2,289 |
| 1.05 Ring & Transfer System | - | - | - | - | - | - | (4) | (65) | (37) | (636) | 902 | 756 | 548 | 1,464 | (704) | 760 |
| 1.06 Target Systems | - | - | - | - | - | - | (5,336) | 1,782 | 2,111 | 473 | 1,734 | 1,054 | 516 | 2,333 | (706) | 1,627 |
| 1.07 Instrument Systems | 0 | - | - | - | - | - | (625) | 895 | (36) | 102 | (35) | (45) | (44) | 213 | (257) | (44) |
| 1.08 Conventional Facilities | - | - | - | - | - | - | 1,930 | 1,343 | 180 | 380 | 785 | 735 | 692 | 6,044 | 2,716 | 8,760 |
| 1.09 Integrated Control Systems | - | - | - | - | - | - | (789) | 56 | 37 | (15) | 33 | (98) | 42 | (733) | 846 | 112 |
| TOTAL AUTHORIZED CHANGES | 0 | - | - | - | - | - | (9,401) | 4,030 | 3,718 | 1,301 | 4,776 | 3,046 | 2,338 | 9,809 | 3,709 | 13,518 |
| PM BASELINE (END OF PERIOD) | 862,169 | 23,755 | 18,636 | 18,917 | 22,523 | 16,673 | 9,419 | 20,153 | 16,156 | 20,750 | 16,300 | 15,439 | 13,228 | 211,948 | 91,381 | 1,165,497 |
| RECONCILIATION TO CONTRACT BUDGET BASE | | | | | | | | | | | | | | | | |
| DOLLARS EXPRESSED IN: Thousands | | | | | | | | | | | | | | | | |
| DATE: March 16, 2004 | | | | | | | | | | | | | | | | |

Project Change Requests implemented in March are as follows:

| Revision | Description | Impact (Cost/Sched/Tech) | Actual Cost Impact (Total \$) | Revision | Description | Impact (Cost/Sched/Tech) | Actual Cost Impact (Total \$) |
|----------|--|--------------------------|-------------------------------|----------|--|--------------------------|-------------------------------|
| R473 | Update WBS Descriptors | - | - | R484 | Construction Support Costs | Cost | 2,285 |
| R474 | JLAB ETC | Cost/Sched | 2,906 | R485 | CF Staffing | Cost | 2,212 |
| R475 | Target ETC | Cost/Sched | 1,098 | R486 | Ring RF Systems ETC | Cost/Sched | (11) |
| R476 | Correct Title III Baseline | Cost | 284 | R487 | LANSCE Division SNS HPRF Work Scope | Cost/Sched | 118 |
| R477 | Incorporate Approved RFCPs | Cost/Sched | 2,435 | R488 | LLRF ETC | Cost/Sched | - |
| R478 | Increase in Vendor Costs | Cost | 179 | R489 | Reorganize HVAC & Water Sys Budgets | Cost/Sched | - |
| R479 | Installation Drawings | Cost | 370 | R490 | Diagnostics Remaining Work | Cost/Sched | - |
| R480 | Loss Monitor Spares | Cost | 106 | R491 | Mechanical Ring ETC | Cost/Sched | 371 |
| R481 | Ring Cost Offsets | Cost | (277) | R492 | Implement FY04 Labor & Overhead Rates | Cost | (757) |
| R482 | Spare Coils Extract Lambertson Septum Magnet | Cost | 46 | R493 | Adjust Controls Plan to be Consistent with FY04 BA | Schedule | (1) |
| R483 | Cost & Schedule Impacts of TG Building Delay | Cost/Sched | 2,153 | | | | |



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)— $TEC + OPC$