Brookhaven National Laboratory

SNS

Ring and Transfer Lines Systems

S E P T E M B E R

MONTHLY REPORT

01 September – 30 September 2001

Performing Organization: Brookhaven Science Associates
Location: Brookhaven National Laboratory
Upton, New York 11973-5000

Contract Period: October 1998 – June 2006

Brookhaven National Laboratory
SNS MONTHLY PROGRESS REPORT
September 2001
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I. Senior Team Leader Assessment

1. TECHNICAL PROGRESS AND ACCOMPLISHMENTS

- The design of the kicker and PFN for the extraction is complete. A project office review is scheduled in October.
- The Medium Field Power Supply came in below estimate with total saving of about 1.0 M$.
- The following components are 100% complete, ring dipole magnet (32), ring half-cell stand (32), HEBT dipole magnet stand (9), power supply PSC/PSI (260).
- The ASAC review committee was happy with the progresses of the ring physics design, in particular in the improvement of loss model and kicker impedance measurement.
- The BNL year-end close out is about 90% of the planned activities. The deficiency is mainly due to a delayed placement of contract due to project office request.
- BNL completed the ETC exercise with the total ETC of 82.9 M$, a reduction of about 0.85 M$ than the May baseline. In addition, 9.8 M$ is transferred to ORNL for installation and commissioning.

2. ISSUES AND ACTIONS

- None.

3. COST AND SCHEDULE STATUS

3.1 VARIANCE ANALYSIS AND PROJECT COST PERFORMANCE REPORTS

WBS 1.1.3 R&D

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
5115.4	5115.4	5074.1	0.00	0.0%	41.3	0.8%

Variance Statement: Variances are within thresholds. No analysis required.

Project Impact: None.

Corrective Action: None.

WBS 1.5 Ring and Transfer Lines

BCWS	BCWP	ACWP	SV	%	CV	%
39403.1	36370.6	36314.3	(3032.4)	-7.7%	56.3	0.2%

Variance Statement: Cum variances are within thresholds. No analysis required.
Current period SV and CV are driven by 1.5.5, 1.5.6, and 1.5.2, 1.5.3 respectively.

Project Impact: None.

Corrective Action: None

3.2 MILESTONE STATUS

WBS 1.5 and 1.1.3 have no level 0 milestones. Milestone status is listed below.

Milestones	Level 1	Level 2	Level 3	Level 4	Level 5
Project	1	2	8	13	131
FY01	0	0	0	4	24
Due in Next 30 days	0	0	0	0	1
Total Due at present	0	0	3	12	90
Made	0	0	3	11	81
Missed	0	0	0	1	9
Ahead of Schedule	0	0	0	1	0

3.3 PROJECT CRITICAL PATH ANALYSIS

The critical path for the Ring is the Diagnostic Instrumentation, specifically the BPM and IPM systems. The next area that is critical within the ring are the high field magnets, specifically the chromaticity sextupoles and the 30Q44/Q58 magnets.

II. Detail R&D Subproject Status

WBS 1.1.3 – Ring System Development

All work covered by R&D funds is essentially complete except for some material commitments.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
5115.4	5115.4	5074.1	0.00	0.0%	41.3	0.8%

Variance Statement: Variances are within thresholds. No analysis required.

Project Impact: None.

Corrective Action: None.

III. Detail Line Item Subproject Status

WBS 1.5.1 – HEBT Systems

The materials cost and manpower cost estimate for completing the BNL contribution to the SNS project was finalized and sent to the project office. We await review and comment. The work packages for fy2002 were written and the manpower and material estimates for 2002 are nearly complete.

Phone conferences continued with Tesla during the month on the HEBT dipole magnet. The HEBT dipole 1st article core machining was completed, the core has been painted, and bolted together. A complete set of measurements along the gap of the pole tips was taken. The deflection of the core at the pole tips is actually better than anticipated; the cores look very good. The coils have been potted and tested and also look very good. Tesla is doing the final assembly. They still need to fabricate the coil end terminations and jumpers and the water manifolds. The magnets will be shipped in October though Tesla has not provided a definite date yet. They are six months behind schedule. The stands for these magnets have been fabricated and are being painted. They will be shipped to ORNL in October. They are on schedule.

The P.O. change for the trim windings on the 12Q45 coils was processed and approved. It will be charged to the instrumentation account per their PCR. The have ordered steel and copper will not be delivered until mid or late October. Danfysik has revised the delivery date for the quadrupole magnet and the 16CD20 corrector to December 31, 2001. This is three months behind schedule.

All the 8" and 4.5" beam tubes have been received. Revisions were made to 12cm quadrupole beam tubes to standardize the bellows requirements and movable foil mounting adjacent to collimators. Preliminary layout of the injection dump line has commenced after the modeling of beam profiles and trajectories.

Integration of the absorber with the vacuum chamber is continuing. A truncated collimator design is being evaluated.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
3848.4	3618.9	3071.8	(229.5)	-6.0%	547.1	15.1%

Variance Statement: Cum CV $547.1K (15.1%) is driven by 1.5.1.1 HEBT Magnets and Support; whereas procurement performance was acknowledged.

Project Impact: None.

Corrective Action: None.

WBS 1.5.2 – Injection Systems

The materials cost and manpower cost estimate for completing the BNL contribution to the SNS project was finalized and sent to the project office. We await review and comment. The work packages for fy2002 were written and the manpower and material estimates for 2002 are nearly complete.

The injection foil mechanism is being assembled. The design of the dump foil mechanism has begun. A cost estimate for fabrication of a spare injection septum magnet is being generated. A PCR will be submitted for this when the estimate is complete. The parameters for the dump septum magnet have been set. Unfortunately they are significantly revised from the design that was completed. The magnet will have to be redesigned and the fabrication drawings redone. This new effort was included in the ETC estimate. Design of the injection chicane magnets continues.

The fabrication of the first article long injection kicker continues. Detail design for short injection kicker is almost done, but; a modification to add two more turns in the short magnet coil is being worked on. This was requested by SNS Physics Group due to a mistake found in the beam dynamic calculation. While there is a contract for coil fabrication in place with Everson Electric this particular coil was on hold until the first article coil for the long magnet was tested and approved. The cost increase from Everson should be small and the redesign effort for the magnet will be small as well.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
2857.9	2527.0	2532.0	(330.9)	-11.6%	(4.9)	-0.20%

Variance Statement: Injection System cum SV of -$330.9K (-11.6%) is driven by 1.5.2.2 Injection Kicker PS whereas actual costs were greater than planned due to the redesign of the PS (programmable). Current period SV $109.7K (25.5%) and CV $394.6K (73.2%) are driven by 1.5.2.1 Pulsed Magnets procurement.

Project Impact: None.

Corrective Action: None.

WBS 1.5.3 – Magnet Systems

The materials cost and manpower cost estimate for completing the BNL contribution to the SNS project was finalized and sent to the project office. We await review and comment. The work packages for fy2002 were written and the manpower and material estimates for 2002 are nearly complete.

All of the ring dipole magnets have been assembled and pre-survey of these magnets to ORNL survey group parameters is nearly complete. All of the end field shaping pieces have been received and installed on the magnets. 1st article measurement of the first 1.3 GeV dipole with the Allied steel and the full end pole pieces is complete.

Alignment of the ring dipole production measurement coil and stand with the dipole was completed. Fixtures to facilitate use and accurate positioning of the coil were built and installed. Calibration of the coil was completed. By the end of the month, the coil was ready to begin an initial set of measurement tests with the first production dipole.

Phone conferences continued with Tesla during the month on the 21Q40 quadrupole magnet also. The pole tip core slice that they sent to BNL was inspected and found to be incompliance with the drawing. The core machining of the first article was completed and assembly and pinning is underway. The coils have been potted and tested and also look very good. Final bending of the end terminals remains to be completed and Tesla still needs to fabricate the coil end terminations and jumpers and the water manifolds. The magnets will be shipped in October though Tesla has not provided a definite date yet. They are four months behind schedule.

Magnetic measurements of the first article 27CDM30 were begun. To date the vertical dipole and the skew quadrupole windings have been measured, analyzed, and approved for production. However, the skew sextupole winding was found to have a large skew dipole component. A correction for this component is being studied computationally and experimentally. It was found that there was an offset in the start point of all of the windings and that the magnet end effects were larger than expected. Test windings were added to the sextupole windings on all four poles and a power supply was added to power those windings. Testing is underway to verify the computation correction and the revised design (Moving the large sextupole windings by one coil turn).

The machining of the steel core for the 21CS30 and 21CO30 sextupole and octopole corrector magnets is underway at New England Technicoil. Their estimate delivery for both first article magnets is in October. They are on schedule at this time.

The 26Q40 quadrupole pole sample is currently being machined from steel for BNL evaluation. The base assembly is also being fabricated. The steel and coil copper is on order. The first article base assembly is being fabricated. Delivery of first article 26Q40 quadrupole is currently scheduled for December 2001. They are on schedule at this time.

Paper work for the award of the contract for production of the 30Q44/30Q56 1st article magnet is being prepared. Budker Institute of Nuclear Physics in Russia will be awarded this contract. The Statement of Work and the contract are being rewritten to clarify the milestones, schedules, and payment terms for this contract.

The drawings for the 41CD30 are complete and are in the checking queue. The detailed design of the 21S26 high field sextupole continues. The design of the 36CD30 corrector has begun.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
5871.5	5129.0	6991.3	(742.5)	-12.6%	(1,862.3)	-36.3%

Variance Statement: Magnet System has a cum SV of $742.5K (-12.6%) and is driven by 1.5.3.1 High Field Magnets, 30Q44/Q58 Magnet Assy & Test (1st article) whereas BCWS is greater than BCWP; and a cum CV of -$1862.3 (-36.3%) driven by 1.5.3.1 High Field Magnets whereas purchased material is greater than BCWS. FY01 BCWS does not reflect FY00 authorized material purchases received and paid for in FY01. Current period SV $159.9K (37.1%) & CV $381.7K (64.6%) are driven by 1.5.3.2 Low Field Magnet, 41CD30 Corrector Procurement whereas BCWP is significantly greater than BCWS and ACWP.

Project Impact: None.

Corrective Action: None.

WBS 1.5.4 – Power Supply Systems

The procurement process for the medium range supplies continued in September. The next step is a site evaluation during the first week of October. Approval was given by ASD to procure 1.3GeV medium range supplies, and that is what will be awarded near the end of October 01.

All the PSIs and PSCs have been delivered to BNL, and are now going through further testing, burn-in, and software development for both serial port and EPICs applications. In October, additional units will be procured to account for the PCRs of last fiscal year.

Extraction kicker development continues. A design review will be held at BNL and over video conference on October 24.

Injection bump kicker work hit a technical snag in the pulse width modulation circuitry. The solution will be implemented, and full testing is to be witnessed by BNL/SNS near the end of November '01.

The prototype circuitry for the low field correctors is currently under review. Witnessing of first article tests at the vendor's facility is still scheduled for the first week in December.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
1943.4	1029.3	756.3	(914.1)	-47.0%	273.0	26.5%

Variance Statement: Power Supply Systems with cum period SV -$914.1K (-47%) and a cum period CV $273K (26.5%) are driven by 1.5.4.1 Ring Quadrupole PS Procure and 1.5.4.2 Ring

Low Field PS, respectively. Current period SV -$119.2K (-71.7%) is driven by 1.5.4.1 Quadrupole PS & 1.5.4.2 Low Field PS whereas vendor procure under performed. Current period CV -$160.2K (-340%) is driven by 1.5.4.1 High Field PS.

Project Impact: None.

Corrective Action: None.

WBS 1.5.5 – Ring Vacuum System

The 1st halfcell chamber has been assembled on the welding fixture and welded. It has been leak checked and is being surveyed for dimensional accuracy. The layout of the doublet vacuum chambers in the injection straight section has begun.

The 1st article ion pumps have passed the evaluation, with test report forwarded to ASD. The production lot order for all the ring ion pumps has been placed. The order for the 1st article ion pump controllers was placed with the low bidder, Varian Vacuum Products. Comments on the TMP specification were received from ASD and LANL. The spec and system schematic was revised and a response to the comments was issued. The revised specification and the draft statement-of-work for gauge controllers were distributed to partner labs for comments. The RGA specification was reviewed and comments forwarded to ASD for consideration.

Work on setting up chamber production coating continues with installation of lift crane and dipole chamber support plate. The 6m Ti cathode was bent to dipole chamber contour. Six glass tubes were ordered and used for the ceramic chamber coating development. Uniform thickness was achieved when two conductive stripes mounted along the length were used as masks. A paper on TiN coating development was presented at EVC-7.

The Estimate-To-Complete (ETC) for vacuum systems was submitted. The FY02 funding worksheets and the statement of work were also submitted for approval. Vendors for quick-disconnect flanges, gate valves and the inflatable seals were visited.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
2708.9	2472.1	2691.9	(236.8)	-8.7%	(219.9)	-8.9%

Variance Statement: Cum variances are within thresholds. No analysis required. Current period SV $208.7K (74.9%) and CV $263.2K (54%) are driven by 1.5.5.3 Ring Pneumatic Gate Valves Production Cycle whereas BCWP out performed BCWS and ACWP.

Project Impact: None.

Corrective Action: None.

WBS 1.5.6 – RF System

For low level RF, the problem of through put and delay in the system are under detailed study. Specifications of available DSPs are being used to find suitable candidates.

For high level RF, connecting the power amplifier and power supply to the cavity continues.

Accelerator physics: Prepared for ASAC.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
4596.2	4597.4	4025.2	1.2	0.0%	572.2	12.4%

Variance Statement: RF Systems with cum period CV $572.2K (12.4%) is driven by 1.5.6.2 Low Level RF System whereas the actual cost of labor is less than planned. Current period SV $301.3K (108.8%) and CV $334.1K (57.8%) are also driven by 1.5.6.2.

Project Impact: None.

Corrective Action: None.

WBS 1.5.7 – Ring Diagnostics

Group members made contributions for ASAC presentations. BPM feedthrus have been received from Ceramaseal, and acceptance testing is in progress. In their efforts to provide a reliable TiN coating, the Vacuum Group has decided to fire all vacuum components at 400C for cleaning. The BPM PUEs were not designed to be baked or fired, and this new specification results in a variety of problems. Work is underway to find solutions to these problems. Shops work continues on PUE fabrication.

Preliminary IPM design continues. Layout includes magnets and supporting stands. Calculations indicate the uniformity of the electric field is not an issue, and magnetic analysis continues. Structural analysis of the vacuum chamber indicates acceptable maximum deflections.

We are investigating an alternate souce for the ion chamber assembly (LND, Inc.), due to reliability problems with the present vendor. Front end circuitry breadboard analysis continues.

A prototype breadboard is being stuffed for delivery to Berkeley. The analog front end electronics schematic is being updated. LabVIEW signal conditioning algorithms, and algorithm testing is underway. The LANL digital interface board has been received along with some test and driver software. Installation and initial testing is underway. Calibrator design is in progress.

Fabrication of the MEBT Carbon Wire Scanners is in progress.

A group member gave a presentation on the Laser wire to ASAC. The 200MeV Laser Wire has been installed in the BNL Linac. Cabling is complete, and an application to operate the laser and stepper motors and acquire data from the current monitor and BPMs has been written and tested. Work is underway to use a photodiode to obtain a low-jitter pulse to act as an integration gate.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
4738.4	4320.0	4027.0	(418.4)	-8.8%	293.1	6.8%

Variance Statement: Cum variances are within thresholds. No analysis required. Current period SV $75K (29.3%) is driven by 1.5.7.1 BPM Procure Fab & Assy, 1.5.7.2 IPM Detail Design and 1.5.7.4 BCM Detail design whereas BCWP is greater than planned.

Project Impact: None.

Corrective Action: None.

WBS 1.5.8 – Collimation and Shielding

Work is progressing on the design of the scraper module. Drawings for the prototype module are currently in checking.

Modifications to the shield suggested by the safety committee in the prototype shield are still progressing.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
1101.2	1096.3	1150.4	(4.9)	-0.4%	(54.1)	-4.9%

Variance Statement: Cum variances are within thresholds. No analysis required. Collimation and Shielding has a current period SV of $42.2K (82.4%) and is driven by 1.5.8.2 Moveable Shielding Procurement whereas BCWP is greater than planned; and current period CV $58.2K (62.2%) which is also driven by 1.5.8.2 Moveable Shielding.

Project Impact: None.

Corrective Action: None.

WBS 1.5.9 – Extraction System

The materials cost and manpower cost estimate for completing the BNL contribution to the SNS project was finalized and sent to the project office. We await review and comment. The work packages for fy2002 were written and the manpower and material estimates for 2002 are nearly complete.

Impedance testing of the prototype extraction pulsed magnet is nearly complete. Full power testing in vacuum chamber will be next. A thermocouple will be installed on the ferrite magnet core to measure temperature rise of ferrite. The PFN oil tank and the internal parts are being fabricated.

Effort continues on revising the layout of the extraction region and the RTBT line to take into account the roll of the lambertson magnet. The designer for this area has been reassigned until this effort is completed and the revised parameters for the lambertson magnet are approved.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
1055.0	964.1	869.8	(90.9)	-8.6%	94.3	9.8%

Variance Statement: Cum variances are within thresholds. No analysis required. Current period SV $197.7K (297.1%) is material driven by 1.5.9.2.2 Charging Power Supply. Current period CV is also by 1.5.9.2 Extraction Kicker Power Supply.

Project Impact: None

Corrective Action: None.

WBS 1.5.10 – RTBT System

The materials cost and manpower cost estimate for completing the BNL contribution to the SNS project was finalized and sent to the project office. We await review and comment. The work packages for fy2002 were written and the manpower and material estimates for 2002 are nearly complete.

3D computer field analysis is being done on the 36Q85 magnet to determine the best design of the radiation resistant coils continues.

The design of RTBT vacuum system continues with effort focused at extraction region and at dump windows.

Due to difficulties with acquiring borated stainless steel for the construction of the first article a modified design using borated aluminum plates attached to the outside of the inner collimator

cylinder was configured. This solution should have a minimal impact on the delivery date of the first article, and the cost impact should be small.

Final drawings for inner and outer collimator shielding are being prepared.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
1704.4	1667.5	1508.1	(36.9)	-2.2%	159.4	9.6%

Variance Statement: Cum variances are within thresholds. No analysis required. Current period CV of -$225.4K (-184.7%) is driven by 1.5.10.2 RTBT High Power PS whereas a significant procurement was expensed subsequent to previously posted BCWP.

Project Impact: None.

Corrective Action: None.

WBS 1.5.12 – Technical Support

The ETC was submitted to the PO for review and comment.

The AP group mainly worked in the following

- Four people from the AP group presented talks in the ASAC review
- Commissioning Plan:
  A first comissioning plan for the ring was discussed with Stuart Henderson. Detailed write-ups for the Ring transport and optics are being worked out.
- Kicker measurements:
  Measurement of the transverse coupling impedance for the Full-size prototype of the SNS Extraction kicker in the vessel. Test of the ferrite windings (YY loop). Study on the ceramic coating for the SNS injection kicker.
- Space Charge Study:
  Group studying several important issues related to space-charge limit in a Ring: Improvement of Loss Model.
- End –to-end simulation
  End-to-end simulation with linac input distribution with errors including HEBT, RING and RTBT
- MISC

Discrepancies in the magnet parameters list (J.Negrin) and power supplies specs (B.Lambiase) have been clarified.

The location of two longitudinal ring BPMs was assigned and communicated to the RF group.

Ring element coordinates are being checked in view of a discrepancy of a few millimeters in the arc, between ORNLs and BNLs drawings.

The effect of a power supply failure to a worst case scenario case was worked out in view of the proposal from ORNL management to remove the corrector power supplies' control with the machine main interlock.

Extraction and injection kicker parameters are being rechecked for the new working points.

Dipole Magnet prototype point measurements have been communicated by magnet group and are analyzed.

The location of the IPM's where assigned and communicated to the responsible engineer.

Variance Analysis (Cumulative to date) ($K)

BCWS	BCWP	ACWP	SV	%	CV	%
8937.0	8937.0	8689.8	0.0	0.0%	247.2	2.8%

Variance Statement: Variances are within thresholds. No analysis required.

Project Impact: None.

Corrective Action: None.

WBS 1.9.1 – R&D

WBS 1.9.2.2 – Global Timing

V124s
The rev "B" V124s PCB was received late last week. All components to assemble one module are in house. A quick check of the PCB indicate the grounding changes appear to be correct. We will begin to assemble the module later this week. We will go out for bids on the production run sometime in late September or early October.

Some final values for the PLL components are being worked on to cover the frequency range of the eventlink for operating energies between 860 MeV and 1.3 GeV. This will allow the V124s to work over the frequency range without changes.

After the new prototype is completed we will decide if a small quantity of pre-production modules need to be built to satisfy early needs.

V123s
There has been no activity on this since the engineer was on vacation until the end of September. At that time, the final PCB changes will be made for the two production modules that are to be delivered.

A prototype eventlink master and RTDL master remain set up in the SNS controls lab for driver development.

WBS 1.9.2.2 –Timing Software

Event Timing System:

The beta version of the Event Timing software is complete. Testing and documentation will be completed in a few days. The software will be placed on the WEB and the CVS repository at ORNL early in October.

Software for the Event Timing slave and input boards is continuing.

RTDL System:

The beta version of RTDL master software was released last month. Integration testing with the Utility module and beam permit modules will be done when these modules become available.

WBS 1.9.5.1 -Ring Controls Integration

Office space, computers, network etc are being prepared for three new arrivals expected in the next three months.

We continue to work with ORNL to make sure that the development environments at BNL and ORNL are the same.

WBS 1.9.5.2 - Power Supply Controls

PSI:
We have setup 24 PSI boards in the lab for test purposes. On the first batch of units we are doing a burn in, checking calibration, determining temperature buildup as a function of spacing, checking turn on/off procedures etc. We need the PSI setup to test the PSC under load conditions.

PSC:
We received PROMs and documentation that reflect the latest changes to the VME memory map interface to the PSC. We are now modifying the Epics drivers for the new interface definition. As this is being done, we are also writing a power supply application and it will be used to test

the PSC. With the Epics application we will be able to do a burn in test where we have several boards running simultaneously with all channel reading data at a high rate.

Power Supply Application:
The main objective during this period is to prepare for building a production version of the Power Supply Control system. A secondary objective is to move to the Linux development environment installed and maintained by ORNL.

The automated IOC database configuration has been extended to include engineering units conversion and scaling functions that are built into EPICS. These functions translate between the decimal values displayed on operator screens (Volts, Amps) and the raw binary values used by the digital-to-analog and analog-to-digital converters. We can make use of existing EPICS features to perform these functions. A prototype database (IOC Configuration Report), for the HEBT Power Supply IOC is included below. This will be extended as necessary to include all power supply parameters.

Linux Development Environment:
A problem with the sysAuxClk functions in the vxWorks MVME2300 Board Support Package was identified and reported to the SNS Control Systems Group at ORNL. We were advised that ORNL is not supporting the MVME2300 at this time, and that we should consider moving our applications to the MVME2100 platform. ORNL agreed that as manpower became available they would start to maintain the MVME2300. In the meantime we switched from the MVME2300 to the MVME2100 for the power supply application.

IOC Configuration Report

IOC Name: HEBT_Ctl:IOC_1
Building: HEBT Service Building
Cabinet: HEBT_Ctl: Cab01

Power Supply Interface Mappings:

PSNAME	SYSTEM	PSCNUM	CHANNELNUM	IMAX	VMAX	POLARITY	PS Type
DCH6	HEBT	0	0	20	35	BIPOLAR	TBD
DCH8	HEBT	0	1	20	35	BIPOLAR	
DCV5	HEBT	0	2	20	35	BIPOLAR	
DCV7	HEBT	0	3	20	35	BIPOLAR	
QH10	HEBT	0	4	375	30	UNIPOLAR	
QH2	HEBT	0	5	375	30	UNIPOLAR	
QH4_6	HEBT	1	0	375	30	UNIPOLAR	
QH8	HEBT	1	1	375	30	UNIPOLAR	
QV1	HEBT	1	2	375	30	UNIPOLAR	
QV11	HEBT	1	3	375	30	UNIPOLAR	
QV3	HEBT	1	4	375	30	UNIPOLAR	
QV5	HEBT	1	5	375	30	UNIPOLAR	

PSNAME	SYSTEM	PSCNUM	CHANNELNUM	IMAX	VMAX	POLARITY	PS Type
QV7	HEBT	2	0	375	30	UNIPOLAR	
QV9	HEBT	2	1	375	30	UNIPOLAR	
DH12_thr_18	HEBT	2	2	900	160	UNIPOLAR	
QH12-thr-18	HEBT	2	3	400	60	UNIPOLAR	
QH20	HEBT	2	4	375	30	UNIPOLAR	
QV13-thr-19	HEBT	2	5	400	60	UNIPOLAR	
QV21	HEBT	3	0	375	30	UNIPOLAR	
DCH14	HEBT	3	1	20	35	BIPOLAR	
DCH16	HEBT	3	2	20	35	BIPOLAR	
DCV15	HEBT	3	3	20	35	BIPOLAR	
DCV17	HEBT	3	4	20	35	BIPOLAR	
DCV21	HEBT	3	5	20	35	BIPOLAR	
QH22	HEBT	4	0	375	30	UNIPOLAR	
QV23	HEBT	4	1	375	30	UNIPOLAR	
DCH22	HEBT	4	2	20	35	BIPOLAR	
DCV23	HEBT	4	3	20	35	BIPOLAR	
DH11	HEBT	4	4	700	40	UNIPOLAR	
QH24	HEBT	4	5	375	30	UNIPOLAR	
DCH24	HEBT	5	0	20	35	BIPOLAR	
DCV6	LDmp	5	1	20	35	BIPOLAR	
DCH4	LDmp	5	2	20	35	BIPOLAR	
QV5_6	LDmp	5	3	375	30	UNIPOLAR	
QH3_4	LDmp	5	4	375	30	UNIPOLAR	
QV2	LDmp	5	5	375	30	UNIPOLAR	
QH1	LDmp	6	0	375	30	UNIPOLAR	

NOTE: Complete power supply names are formed from the *SYSTEM* and *PSNAME* fields as follows:

*SYSTEM*_PS**:***PSNAME* Examples: HEBT_PS:DCH6, LDmp_PS:DCV6

WBS 1.9.5.3 – Diagnostics

BLM:
We ordered a 24-bit VME ADC board for the BLM monitor system. In addition we will also be acquiring a VMIC 16-bit ADC board for the BLM system to be used where high accuracy is not needed. We expect to start testing these boards next month.

Laser Wire:
We worked with the diagnostic group on the development of controls for the Laser wire. Hardware to test the system is to be inserted in the BNL Linac for test purposed early in October. We provided a PC control system that would control the Laser(serial port), Scope(ethernet) and motors(PCI bus). Software sufficient to checkout the hardware is being worked on and should be

completed in time to allow installation in early October. When this software is complete, application software to move motors, collect and process data etc will be developed.

WBS 1.9.5.4 - Vacuum

Some additional parts for the Vacuum Control System were ordered. Most work is postponed until the decision on which controllers will be ordered is made.

WBS 1.9.5.5 - Application Software

SNS Application Toolkit:
A Java-based approach for displaying the EPICS records was implemented. A Web based demo was setup but can only be accessed from local computers at BNL because of firewall restrictions. We will try to get these restrictions lifted if we can do so without impacting security.

Installed the EPICS environment and the Java Channel Access (JCA) extension on a PC running Windows 2000.

The Ptolemy 2D plot package with Java classes, Plot and LivePlot was extended adding the effective interface for accessing plot data.

Implemented the Java package (PValueReader, PValueDisplay, etc.) providing connectivity between Java Channel Access (JCA) and Ptolemy 2D plot.

WBS 1.9.5.6 – RF

Some additional parts were ordered for the High Level RF Control System development lab. Most work on the high level RF is being postponed until we have the definition of parameters and control points.

The Low Level RF has requested the setup of a VME IOC in the RF lab. This will be done next month and will be used to give the RF group some experience with EPICS.

IV. Earned Value Reports and Charts

1.5 Efficiency Indices & Trends