April 8, 2003

To: Paul Philp
DOE Project Manager, Run IIb CDF Detector Project

From: Pat Lukens
Project Manager for the Run IIb CDF Detector Project

Subject: Revised Run IIb CDF Detector Project Monthly Report

Attached is the monthly report summarizing the February 2003 activities and progress for the Fermilab Run IIb CDF Detector Project. An updated Cost Performance Report has been added.

This report is available electronically at: http://www-cdf.fnal.gov/run2b.html

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RunIIb CDF Detector Project
Progress Report No. 3
1 - 28 February 2003

I. PROJECT DESCRIPTION

The primary goal of the CDF Run IIb Detector Project is to enable the detector to exploit the physics opportunities available during Tevatron operation through 2008. The data from Run II will represent a set of detailed measurements that can be compared with the predictions of the Standard Model at the highest available collision energy. The main focus of the experiment in Run IIb will be the continuation of the search for the Higgs boson. The increased size of the data sample will also allow us to study the top quark by measuring the details of its production and decay mechanism. In addition, we plan precision electroweak and QCD measurements, continued searches for a variety of phenomena that are predicted to exist beyond the Standard Model framework, and to explore CP violation in the *b* quark sector. The detailed physics goals of the upgrade are described in the Technical Design Report (TDR).

The major tasks of this upgrade are:

- Replace the silicon micro-vertex detector with a device capable of withstanding the expected radiation dose for Run IIb and with fast r-ϕ (axial) and small angle stereo readout.
- Upgrade the calorimeter by replacing the Central Preradiator Chamber with a device with shorter response time to allow operation in a high-luminosity environment, and adding timing information to the electromagnetic calorimeters.
- Upgrade the data acquisition and trigger systems to increase throughput needed for higher luminosity operation and efficiently trigger on the higher multiplicity events of Run IIb.

II. OVERVIEW OF PROJECT STATUS – P. Lukens

The project received approval for construction in February 2003. This enables a number of large requisitions to be placed. All schedules have been modified to reflect this approval date. No work that is considered construction will be scheduled to occur prior to March 2003. We are now able to establish the Budgeted Cost of Work Scheduled (BCWS) on equipment funds, and we show it for the first time in this report. The readjustments to the schedule that were needed to accommodate the late date of project approval have not caused any milestones to slip.

The Silicon Detector subproject held a Production Readiness Review for the outer layer silicon sensors. The review committee consisted of several silicon detector experts outside the CDF collaboration. They found that the plans for QA/QC were good and we have since submitted the purchase requisition. This purchase is being made simultaneous to one placed by our colleagues at University of Tsukuba, in Japan.

In collaboration with D0, the SVX4 chip was submitted for manufacture, in its second version. This occurred later than our 20 Feb milestone.

III. PROJECT MILESTONE SUMMARY

CDF Level 2 Schedule Milestones from the Resource Loaded schedules

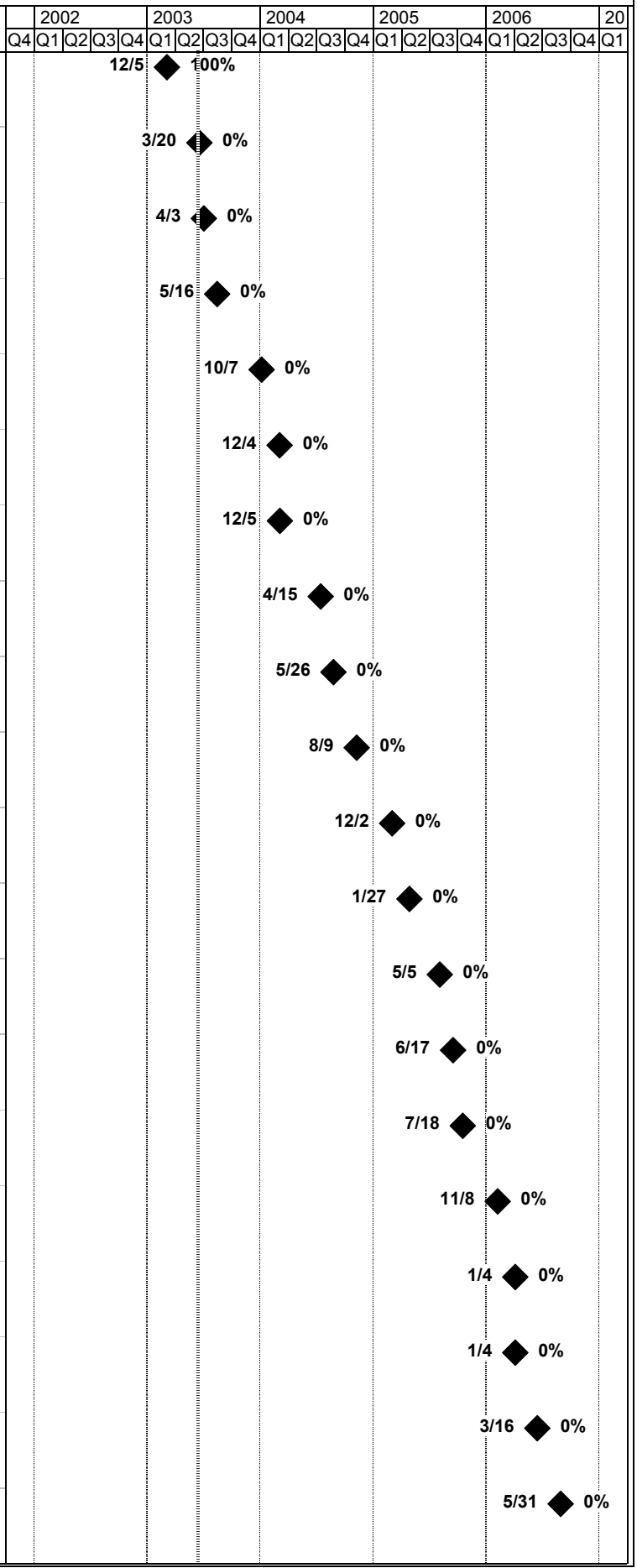
WBS	Title	Baseline Completion Date	Forecast/Actual Completion Date	Complete
1.1.5.4.1.13	Prototype stave #1 complete	5-Dec-02	5 Nov 02	Yes
1.1.2.1.2.4	2nd chip submission	20-Feb-03	18-Mar-03	
1.1.2.10.2.4	Testing #1 complete- go ahead for #2	3-Apr-03	3-Apr-03	
1.3.3.2.3.4	Begin fabrication of Prototype Finder 1/3 board	11-Apr-03	11-Apr-03	
1.2.1.10.1	First phototube order placed	9-May-03	9-May-03	
1.1.3.1.2.4	Production Sensor submission	16-May-03	16-May-03	
1.2.2.2.7.1	Prototype Testing Complete	16-May-03	16-May-03	
1.2.2.2.7.4	ASD->TDC Cables ready for install	16-May-03	16-May-03	
1.2.2.2.7.2	CEM Splitters ready for installation	19-May-03	19-May-03	
1.3.3.8.1.9	Prototype Linker Module avail for test	9-Jun-03	9-Jun-03	
1.2.2.2.7.3	PEM Harnesses ready for installation	2-Sep-03	2-Sep-03	
1.2.2.2.7.5	All cables done and ready to install	2-Sep-03	2-Sep-03	
1.1.2.1.3.5	Production chip submission	9-Sep-03	7-Oct-03	
1.3.5.2.5	Arrival of 0/10 PCs from the vendor	10-Sep-03	10-Sep-03	
1.2.1.10.2	1st WLS fiber holder finished	7-Oct-03	7-Oct-03	
1.2.2.2.7.8	VME Crate ready for installation	7-Oct-03	7-Oct-03	
1.1.2.10.3.4	Go ahead for Preproduction	11-Nov-03	4-Dec-03	
1.3.1.6.7	First Prototype TDC available for testing	19-Nov-03	19-Nov-03	
1.1.6.3.1.1.5	Stave & screen mounting tests complete	5-Dec-03	5-Dec-03	
1.2.1.10.4	1st CPR module finished and tested	11-Dec-03	11-Dec-03	
1.2.2.2.7.10	Upstairs components ready to install	7-Jan-04	7-Jan-04	
1.2.2.2.7.11	All EM Timing components ready to install	7-Jan-04	7-Jan-04	
1.2.2.2.7.6	ASD/TB ready for installation	7-Jan-04	7-Jan-04	
1.2.2.2.7.7	Downstairs components ready to install	7-Jan-04	7-Jan-04	
1.2.2.2.7.9	TDC boards ready for installation	7-Jan-04	7-Jan-04	
1.2.1.10.3	First set of phototubes tested	30-Jan-04	30-Jan-04	
1.2.1.10.6	1st CCR module finished and tested	12-Feb-04	12-Feb-04	
1.1.2.3.1.3.12	Preproduction hybrid available	25-Mar-04	15-Apr-04	
1.2.1.10.5	Second set of phototubes tested	21-May-04	21-May-04	
1.1.5.2.2.8	L0 prototype modules complete	26-May-04	26-May-04	
1.3.4.4.1.4	Arrival of the hardware	3-Jun-04	3-Jun-04	
1.2.1.10.7	50% CPR Detectors Tested	4-Jun-04	4-Jun-04	
1.3.3.10.3.3	Preproduction of Stereo Assoc Modules	21-Jun-04	21-Jun-04	
1.3.4.5.3	Production Readiness Rev - Event Builder	24-Jun-04	24-Jun-04	
1.1.2.10.4.6	Go ahead for DAQ production	19-Jul-04	9-Aug-04	
1.2.1.10.8	50% CCR Detectors tested	30-Aug-04	30-Aug-04	
1.3.2.6.3	Begin production of Level 2 Pulsar system	17-Sep-04	17-Sep-04	
1.3.3.2.6.9	Begin Production Finder SL7 boards	14-Oct-04	14-Oct-04	
1.1.2.3.1.4.9	Production hybrid available	9-Nov-04	2-Dec-04	
1.3.3.8.3.3	Begin Production Linker Modules	13-Dec-04	13-Dec-04	

Milestone list continues on following page

WBS	Title	Baseline Completion Date	Forecast/Actual Completion Date	Complete
1.3.6.5	SVT ready for installation	13-Dec-04	13-Dec-04	
1.1.5.3.4.8	Production module available	5-Jan-05	27-Jan-05	
1.3.1.12	Beginning of TDC Production	10-Jan-05	10-Jan-05	
1.3.4.5.4.4	Arrival of the hardware	3-Feb-05	3-Feb-05	
1.2.1.10.10	Final CCR Detector Tested	24-Mar-05	24-Mar-05	
1.2.1.10.9	Final CPR Detector Tested	24-Mar-05	24-Mar-05	
1.3.5.5.5	Arrival of 70 L3 & 15 DAQ PCs from the vendor	24-Mar-05	24-Mar-05	
1.3.5.6.5	Arrival of 140/20 PCs from the vendor	24-Mar-05	24-Mar-05	
1.3.5.8	Finish Purchase of Computers for L3/DAQ	14-Apr-05	14-Apr-05	
1.1.6.1.11.3.5	L0 Supports Complete	5-May-05	5-May-05	
1.3.4.8	Finish Event-Builder Upgrade	5-May-05	5-May-05	
1.2.1.10.11	Final set of phototubes tested	6-May-05	6-May-05	
1.2.1.10.12	End of Central Preshower Project	6-May-05	6-May-05	
1.2.3.5	End of Calorimetry Project: Level 2	6-May-05	6-May-05	
1.1.5.4.4.11	100 Production staves complete	26-May-05	17-Jun-05	
1.3.1.14.16	Data Concentrator Production Completed	2-Jun-05	2-Jun-05	
1.3.2.9	Pulsar Level 2 subproject ready for installation	9-Jun-05	9-Jun-05	
1.1.6.3.1.3.3	Stave Installation Begins	24-Jun-05	18-Jul-05	
1.3.3.10.4.6	Production Stereo Association Modules complete	6-Jul-05	6-Jul-05	
1.3.3.23	XFT Ready for Installation at CDF	6-Jul-05	6-Jul-05	
1.3.1.13.10	Production Board testing complete	30-Sep-05	30-Sep-05	
1.3.1.16	Run 2b TDC Ready for Installation	30-Sep-05	30-Sep-05	
1.3.8	Finish Run 2b Trigger DAQ project	30-Sep-05	30-Sep-05	
1.1.5.4.4.14	Production staves complete	18-Oct-05	8-Nov-05	
1.1.6.3.1.3.8	Stave Installation Complete	8-Dec-05	4-Jan-06	
1.1.6.3.2.3.6	Inner detector complete	4-Jan-06	4-Jan-06	
1.1.6.3.1.3.16	Outer detector complete	23-Feb-06	16-Mar-06	
1.1.6.4.8	SVX2b Ready for Installation into ISL	31-May-06	31-May-06	

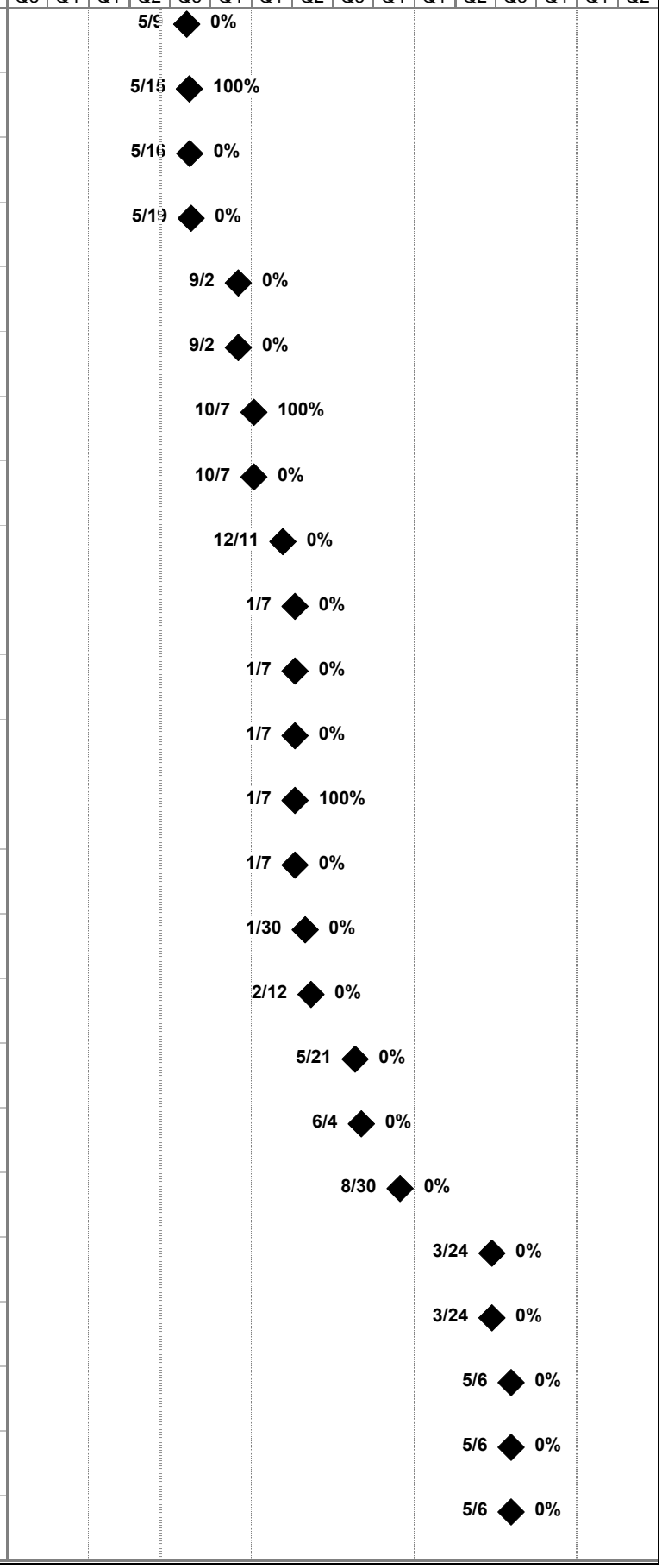
CDF Run2b Silicon Detector Schedule Level 2 Milestones

ID	Task Name	
117	**Prototype stave #1 complete**	**12/5 100%**
219	**2nd chip submission**	**3/20 0%**
293	**Testing #1 complete- go ahead for #2**	**4/3 0%**
43	**Production Sensor submission**	**5/16 0%**
231	**Production chip submission**	**10/7 0%**
298	**Go ahead for Preproduction**	**12/4 0%**
704	**All stave installation and screen mounting tests complete**	**12/5 0%**
380	**Preproduction hybrid available**	**4/15 0%**
66	**L0 prototype modules complete**	**5/26 0%**
305	**Go ahead for DAQ production**	**8/9 0%**
390	**Production hybrid available**	**12/2 0%**
102	**Production module available**	**1/27 0%**
626	**L0 Supports Complete**	**5/5 0%**
150	**100 Production staves complete**	**6/17 0%**
714	**Stave Installation Begins**	**7/18 0%**
155	**Production staves complete**	**11/8 0%**
697	**Inner detector complete**	**1/4 0%**
719	**Stave Installation Complete**	**1/4 0%**
727	**Outer detector complete**	**3/16 0%**
736	**SVX2b Ready for Installation into ISL**	**5/31 0%**



CDF Run IIb Calorimeter Level 2 Milestones

ID	Name	
106	**First phototube order placed**	**5/9 0%**
39	**Prototype Testing Complete**	**5/15 100%**
40	**ASD->TDC Cables ready for installation**	**5/16 0%**
41	**CEM Splitters ready for installation**	**5/19 0%**
42	**PEM Harnesses ready for installation**	**9/2 0%**
43	**All cables done and ready for installation**	**9/2 0%**
44	**VME Crate ready for installation**	**10/7 100%**
107	**First WLS fiber holder finished**	**10/7 0%**
108	**First CPR module finished and tested**	**12/11 0%**
45	**ASD/TB ready for installation**	**1/7 0%**
46	**Downstairs components ready for installation**	**1/7 0%**
47	**TDC boards ready for installation**	**1/7 0%**
48	**Upstairs components ready for installation**	**1/7 100%**
49	**All EMTiming components ready for installation**	**1/7 0%**
109	**First set of phototubes tested**	**1/30 0%**
110	**First CCR module finished and tested**	**2/12 0%**
111	**Second set of phototubes tested**	**5/21 0%**
112	**50% CPR Detectors Tested**	**6/4 0%**
113	**50% CCR Detectors Tested**	**8/30 0%**
114	**Final CPR Detector Tested**	**3/24 0%**
115	**Final CCR Detector Tested**	**3/24 0%**
116	**Final set of phototubes tested**	**5/6 0%**
117	**End of Central Preshower Project**	**5/6 0%**
123	**End of Calorimetry Project: Level 2**	**5/6 0%**



CDF Run IIb Trigger/DAQ Level 2 Milestones

ID	Name	2	2003				2004				2005				2006	
		Q2 Q3 Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
226	**Fabrication of Prototype Finder 1/3 board**		4/11	0%												
282	**Prototype Linker Module available for testing**		6/9	0%												
19	**Arrival of 0/10 PCs from the vendor**			9/10	0%											
387	**First Prototype TDC available for testing**			11/19	0%											
61	**Arrival of the hardware**						6/3	0%								
311	**Begin Preproduction Stereo Association Modules**						6/21	0%								
72	**Production Readiness Review - Event Builder**						6/24	0%								
105	**Begin production of Level2 Pulsar system**							9/17	0%							
265	**Begin Production Finder SL7 boards**							10/14	0%							
11	**SVT ready for installation**							12/13	0%							
293	**Begin Production Linker Modules**							12/13	0%							
423	**Beginning of TDC Production**								1/10	0%						
78	**Arrival of the hardware**								2/3	0%						
36	**Arrival of 70 Level3 and 15 DAQ PCs from the vendor**								3/24	0%						
49	**Arrival of 140/20 PCs from the vendor**								3/24	0%						
52	**Finish Purchase of Computers for Level3/DAQ system**								4/14	0%						
83	**Finish Event-Builder Upgrade**								5/5	0%						
442	**Data Concentrator Production Completed**								6/2	0%						
115	**Pulsar Level 2 subproject ready for installation**								6/9	0%						
322	**Production Stereo Association Modules complete**								7/6	0%						
326	**XFT Ready for Installation at CDF**								7/6	0%						
464	**Production Board testing complete**									9/30	0%					
465	**Run 2b TDC Ready for Installation**									9/30	0%					
466	**Finish Run 2b Trigger DAQ project**									9/30	0%					

IV. PROCUREMENT

Major procurements for this period include

Outer layer silicon sensors - $621K
Preproduction hybrid parts - $77K
SVX4 chip submission (this is an R&D cost)$172K

These were is process with Fermilab procurement or submitted to management for approval at the end of the month.

V. PROJECT HIGHLIGHTS

1.1 – Silicon Detector Project

1.1.2 DAQ (Data AcQuisition) – Brenna Flaugher, Nicola Bacchetta

All problems with the previous version of the SVX4 chip have been fully understood and addressed. A complete set of simulations has been conducted on the new version of the chip to verify proper operation. Both CDF and D0 concur with the results of the tests and agree that this version is ready to be released for fabrication. Final files for submission have been prepared and sent to Taiwan Semiconductor Manufacturing Company (TSMC). The two versions of the chip submitted to TSMC for fabrication include Version A (1 sample/reticule, "min" changes from present version) and Version B (5 samples/reticule, "max" changes from present version). In both cases changes are minimal and there is general agreement among the engineers involved that this could, indeed, be the final version of the silicon readout chip. The date for completion of the Level 2 Milestone for 2nd Chip Submission has slipped by slightly more than one week. While the Purchase Requisition was signed by the appropriate Fermilab personnel, the Purchase Order had not been placed by Procurement as of the end of February. This does not present a serious schedule concern, however, since this version of the chip is generally perceived to be the “final” version and will almost certainly negate the necessity of conducting the scheduled third round of engineering, fabrication, and testing.

Work on the layout of both BeO and Polyamide versions of the Mini Port Cards has been completed. Purchase orders for both versions have been submitted and are in the Fermilab Procurement queue.

Twenty five (25) prototype Layer Zero (L0) hybrids have been received and work is underway to load and test them. Also, a number of additional prototype readout cables for L0 have been received. We currently have enough good-quality cables to construct a small number of L0 prototype modules and begin testing them.

Specification of the Fiber Transition Module (FTM) board for the RunIIb DAQ scheme is nearly completed. A review of the FTM specifications was held on the 27th of February and we are currently awaiting the results of that review. Initial indications were that the outcome would be positive. The physical layout of the board proceeds according to plan and is presently approximately 50% complete.

Preliminary specification of the Junction Port Card board has been completed but no layout work has been done yet.

1.1.3 Sensors – Brenna Flaugher, Nicola Bacchetta

A draft report from the January 22nd review was received by the Project in February. The final report is expected during the first week of March. In general the review has been very favorable with respect to the work done on the prototype sensors and the production plan. Minor adjustments to the production plan as suggested by the reviewers will be incorporated. With this in mind, we are proceeding with the order of production sensors. A purchase requisition for sensors has been submitted and is active in the Fermilab Procurement system.

1.1.5 Construction of Modules, Staves, and L0 – Brenna Flaugher, Nicola Bacchetta

We have constructed 3 more axial modules for Stave 3. The major difference with stave 3 is the implementation of a carbon fiber grounding scheme that should help in assuring equipotentiality of the mechanical structure. Work on this stave should be completed by March 7th. Testing of hybrids and modules has been refined and most tools are now close to final configuration.

1.1.6 Support Mechanics – Brenna Flaugher, Nicola Bacchetta

We received the first parts for the prototype bulkhead assembly. This is a small section of the fixture that will be used to install (glue) the precision alignment pins into the CF bulkhead. The parts look extremely good in terms of meeting the tolerances on the pin locations. Tests using this fixture will begin in March. Two new blank CF plates were manufactured for the next prototype bulkheads. The first plate is a 25 micron aluminum layer laminated to the CF for grounding purposes. Flatness of this part has been measured and it is a great improvement with respect to the very first attempt in fabricating it. It now meets our specifications. Also, a piece of a prototype outer screen was constructed. It is rohacell foam sandwiched between CF skins. The piece was constructed as a complete cylinder but will be cut into three pieces for installation. The deformations from the cutting will be studied with this piece before a full prototype is made.

The first Finite Element Analysis results for the Spacetube were received. Based on these initial results, various design options are under consideration.

A conceptual design for the stave installation and barrel assembly has been developed. This includes a technique for supporting and rotating the barrel using the bulkhead mounts. Consideration is also being given to the support and dressing of cooling tubes and cables during the installation and testing process.

Two prototype CF support structures were brought to Fermilab. They look quite good and will be completely inspected on the CMM in the next couple weeks. Cooling studies are underway. The size for the Layer Zero cooling tubes was established and tubing has been ordered. Each of these tests is crucial in establishing whether the present prototype design can be considered final.

1.2 – Calorimeter Upgrades

1.2.1 Central Preshower and Crack Detector – Steve Kuhlmann

The Central Preshower/Crack Upgrade continued to make progress in February on many fronts. Tsukuba placed the first production phototube order during the month of February. The first Level 2 Project Milestone was achieved without using schedule contingency.

The fibers that were delivered to Fermilab last month are being polished and mirrored by Particle Physics Division personnel in the Village laboratories. A coating of UV epoxy will be applied to protect the mirrored ends. Michigan State University produced optical connectors and is working closely with Fermilab to detail the proper method for splicing the polished ends. Argonne completed the documentation on the design of the Crack detector layout and is currently in the process of building an operational mechanical prototype. The prototype light yield test effort begun last month by Pisa continued smoothly during February with no significant deviations from expected results.

1.2.2 Electromagnetic Timing – Dave Toback

February saw the on-detector integration of the CEM splitters and PEM wedges into normal data taking with the full hardware stream from the PMT to the TDC and into readout. This includes 3 wedges of the PEM and 2 channels of CEM splitters.

All of the parts for the TDC have been installed and the connections to the rest of the TDC system are nearly done. Testing of the crate is expected to begin in the next month. We have begun cable production according to schedule since there are no known problems. Our test stand room is fully functional with production quality components. The bulk of our efforts have been in debugging individual problems with the existing hardware and the online and offline software for the project.

1.3 –Data Acquisition and Trigger Project

1.3.1 TDC (Time to Digital Converter) Project – Kevin Pitts

The TDC upgrade project has made excellent progress. The sign-off on trigger data formats with the XFT group has been completed. Work continues on the TDC internal data processing chain. Significant progress has been made on high speed data readout. Tests at Fermilab have shown that VME backplane data rates are not a limiting factor when using "chained block transfer" (CBLT). To fully take advantage of high-speed data access, a PCI readout path must be utilized to bypass the limitation of the TAXI (Tracer to VRB data link). This has been discussed with DAQ and Event Builder experts and further tests are underway. The XFT project has defined the data inputs needed from the TDC. Work continues on firmware designs for the new finder boards.

1.3.3 XFT (eXtremely Fast Tracker) II Project – Kevin Pitts

The CDF Level 2 Trigger system upgrade continues to make excellent progress. Pulsar data I/O tests have been successful with different types of interfaces, including hotlink mezzanine cards, a CERN Aux card, and S-Link to PCI. Data has been transferred without error from Pulsar->Pulsar->PCI->PC. Additionally, for the first time a Gigabit Ethernet card from Argonne has been incorporated into the system. Current work is ongoing to extend these tests to Taxi mezzanine boards.

Manpower on the L2 upgrade has solidified as well, with well-defined tasks for the members of the Fermilab, Penn, Chicago and Argonne groups. Additional information regarding project status can be found on the web at http://hep.uchicago.edu/~thliu/projects/Pulsar/ for interested parties.

VI. EARNED VALUE

The accompanying tables and charts are the Cost Performance Reports generated from COBRA. These give a summary of the financial tracking of the project, as measured by the Earned Value. Input data for the earned value calculation originates with the status of project completion, as reported by the Level 2 managers, and actual costs extracted from the Fermilab accounting system. This is first month we are able to show these quantities with the proper schedule for equipment funds. We have no further plans for showing R&D fund reports.

A number of specialized terms and abbreviations are used in the reports. They are defined here for convenience:

ACWP – Actual Cost of Work Performed. This is the actual cost of tasks that have been completed.
BAC – Budget at Completion. The BAC is the budget expected to remain at the completion of the project.
BCWP – Budgeted Cost of Work Performed. This is the scheduled cost profile of tasks that have been completed.
BCWS – Budgeted Cost of Work Scheduled. This is the scheduled cost profile, as determined by the resource loaded schedules.
CPI – Cost Performance Index. $CPI = \frac{BCWP}{ACWP}$
CV – Cost Variance. $CV = BCWP - ACWP$
EAC – Estimate At Completion
CAMEAC - Estimate At Completion. This is the ACWP to date, plus the BCWS of remaining tasks.
EV – Earned Value. $EV = BCWP$
SPI – Schedule Performance Index. $SPI = \frac{BCWP}{BCWS}$
SV – Schedule Variance. $SV = BCWP - BCWS$
VAC – Variance at Completion $VAC = BAC - EAC$

The following charts and tables are attached:

CDF Project Variance Analysis Report - This report gives a high level summary of the cost and schedule variances of the project as a whole.

CDF EQU Project Cost Performance Report - This report gives a complete earned value calculation of the project down to Level 3 of the Work Breakdown Structure. Earned value calculations are shown for this reporting period as well as the project to date.

CDF Silicon Curve
CDF Calorimeter Curve
CDF Trigger/DAQ Curve
CDF Administration Curve - These four graphs provide a display of the budgeted work scheduled & performed, and depict the history of our estimated total cost at completion of the project. These are divided at Level 2 in the WBS.

CDF Project Variance Analysis Report

Funding Type-CA
EQU

Reporting Period: 12/31/2002 2/28/2003

	BCWS	BCWP	ACWP	SV in $	SV in %	CV in $	CV %	SPI	CPI
Current:	0	10,272	0	10,272	100%	10,272	100%	N/A	N/A
Cumulative:	0	10,272	0	10,272	100%	10,272	100%	N/A	N/A
	BAC	EAC	VAC in $	VAC in %	CPI to BAC	CPI to EAC			
At Complete:	17,379,944	12,354,540	5,025,404	29%	1.00	1.41			

Explanation of Variance/Description of Problem:

Impact:

Corrective Action:

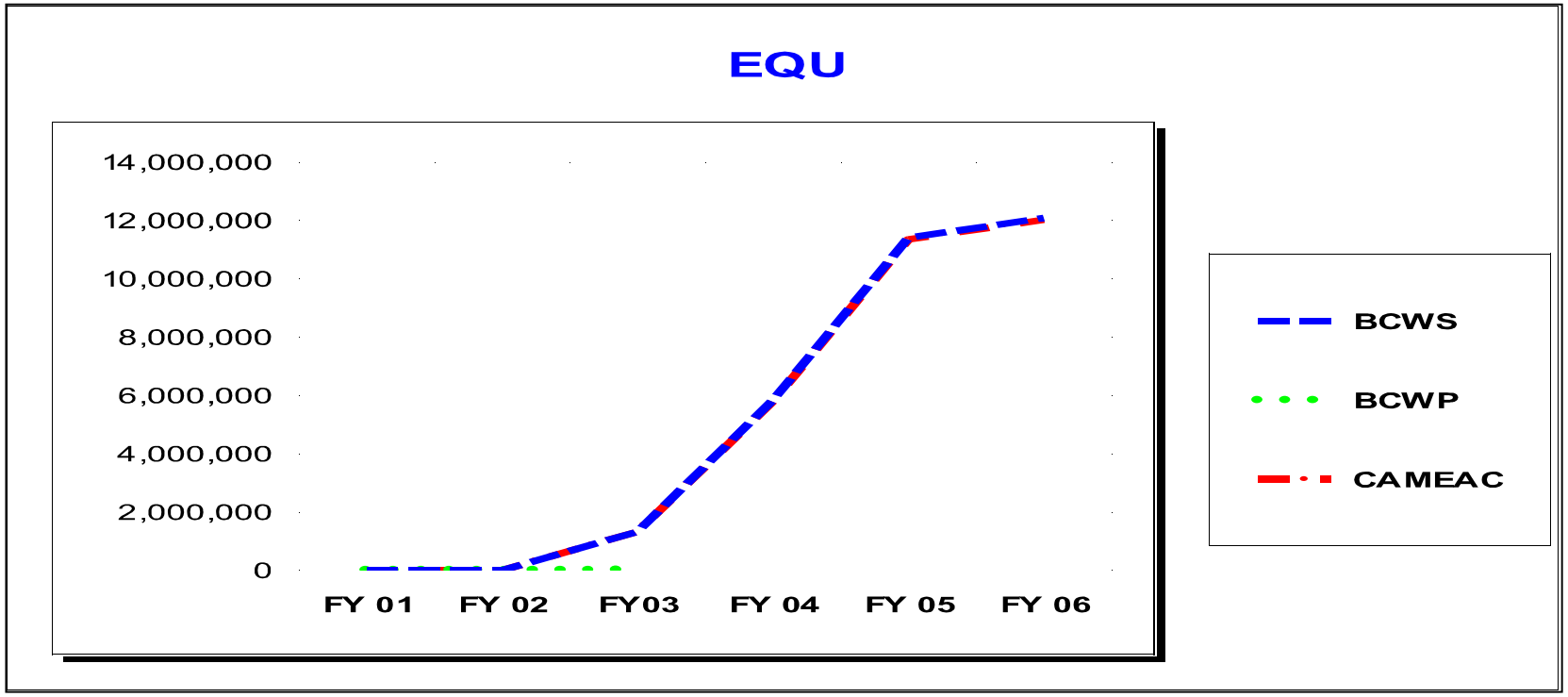
Monthly Summary (to include technical causes of VARs, Impacts) and Corrective Action(s):

Prepared by: Date: Approved by: Date:

EQU Cost Performance Report - Work Breakdown Structure Level 3

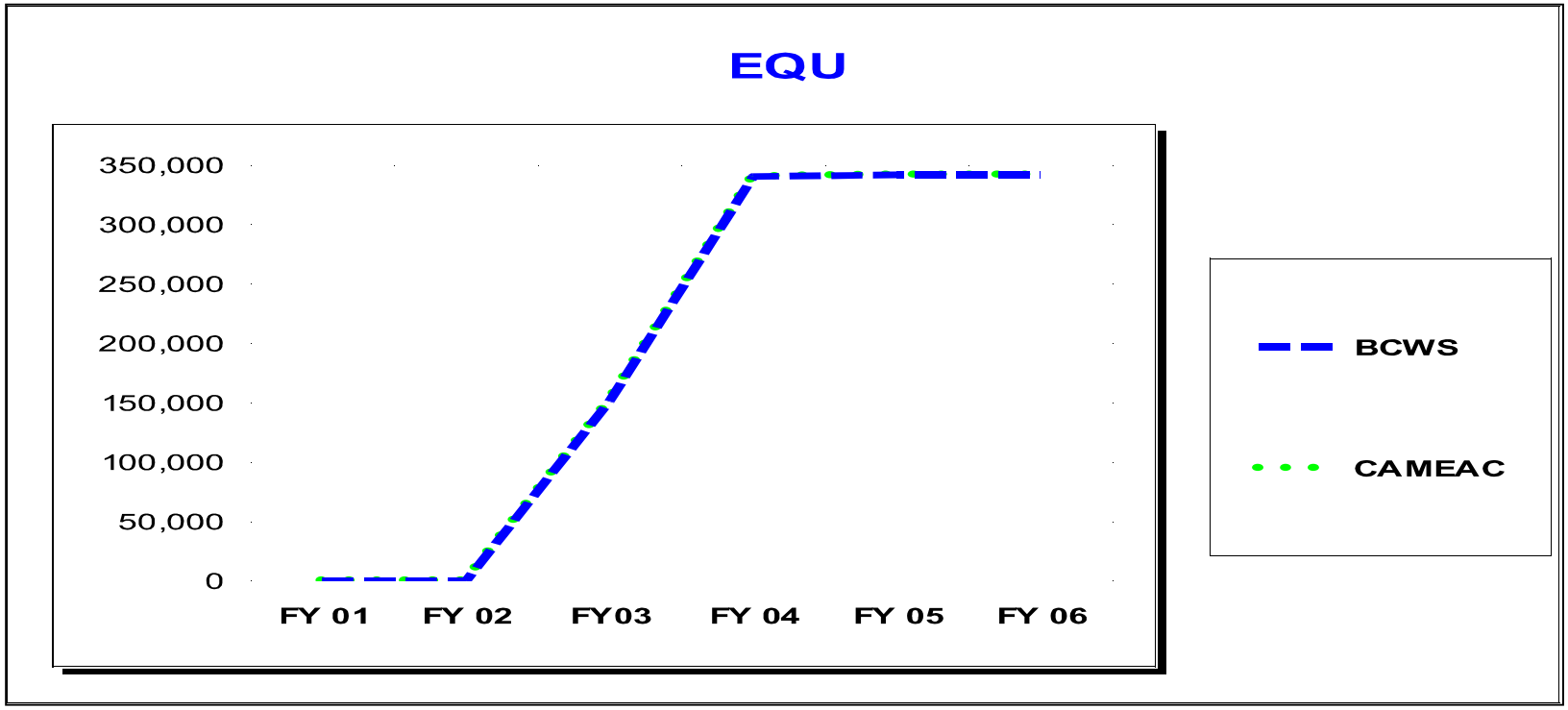
Cost Performance Report - Work Breakdown Structure														
Contractor: Location:					Contract Type/No:			Project Name/No: CDF RIIb Master EQU		Report Period: 12/31/2002	2/28/2003			
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling			
1	24,987,050		0		0	0	24,987,050	0		0	0			
Funding Type-CA WBS[2] WBS[3]	Current Period					Cumulative to Date					At Completion			
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest		
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
EQU														
1.1 Run 2b Silicon Project														
1.1.1 Administration	0	0	0	0	0	0	0	0	0	0	461,456	463,502	-2,046	
1.1.2 DAQ	0	6,071	0	6,071	6,071	0	6,071	0	6,071	6,071	5,307,465	5,289,180	18,286	
1.1.3 Sensors	0	0	0	0	0	0	0	0	0	0	874,755	871,924	2,832	
1.1.4 Cooling and Monitoring	0	0	0	0	0	0	0	0	0	0	464,851	464,260	591	
1.1.5 Construction of Modules, Staves and L0	0	0	0	0	0	0	0	0	0	0	2,141,524	2,114,947	26,576	
1.1.6 Support Mechanics	0	4,201	0	4,201	4,201	0	4,201	0	4,201	4,201	2,825,975	2,821,544	4,431	
WBS[2]Totals:	0	10,272	0	10,272	10,272	0	10,272	0	10,272	10,272	12,076,026	12,025,357	50,669	
1.2 Calorimeter Upgrades														
1.2.1 Central Preshower and Crack Detectors	0	0	0	0	0	0	0	0	0	0	306,093	306,086	7	
1.2.2 Electromagnetic timing	0	0	0	0	0	0	0	0	0	0	35,630	35,630	0	
WBS[2]Totals:	0	0	0	0	0	0	0	0	0	0	341,723	341,716	7	
1.3 Run 2b DAQ and Trigger Project														
1.3.1 Run 2b TDC Project	0	0	0	0	0	0	0	0	0	0	994,942	994,942	0	
1.3.2 Run 2b Level 2 Project	0	0	0	0	0	0	0	0	0	0	366,655	366,655	0	
1.3.3 Run 2b XFTII Project	0	0	0	0	0	0	0	0	0	0	1,146,925	1,146,925	0	
1.3.4 Event-Builder Upgrade	0	0	0	0	0	0	0	0	0	0	515,472	515,472	0	
1.3.5 Computer for Level3 PC Farm / DAQ	0	0	0	0	0	0	0	0	0	0	478,410	478,410	0	
1.3.6 SVT upgrade	0	0	0	0	0	0	0	0	0	0	174,441	174,441	0	
WBS[2]Totals:	0	0	0	0	0	0	0	0	0	0	3,676,845	3,676,845	0	
1.4 Administration														
1.4.3 Construction Phase	0	0	0	0	0	0	0	0	0	0	1,285,349	1,285,349	0	
WBS[2]Totals:	0	0	0	0	0	0	0	0	0	0	1,285,349	1,285,349	0	
Funding Type-CATotals:	0	10,272	0	10,272	10,272	0	10,272	0	10,272	10,272	17,379,944	17,329,268	50,676	
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0	
Undist. Budget											0	0	0	
Sub Total	0	10,272	0	10,272	10,272	0	10,272	0	10,272	10,272	17,379,944	17,329,268	50,676	
Management Resrv.											7,607,106		0	7,607,106
Total	0	10,272	0	10,272	10,272	0	10,272	0	10,272	10,272	24,987,050	17,329,268	7,657,782	

CDF Silicon Curve - 3/13/2003



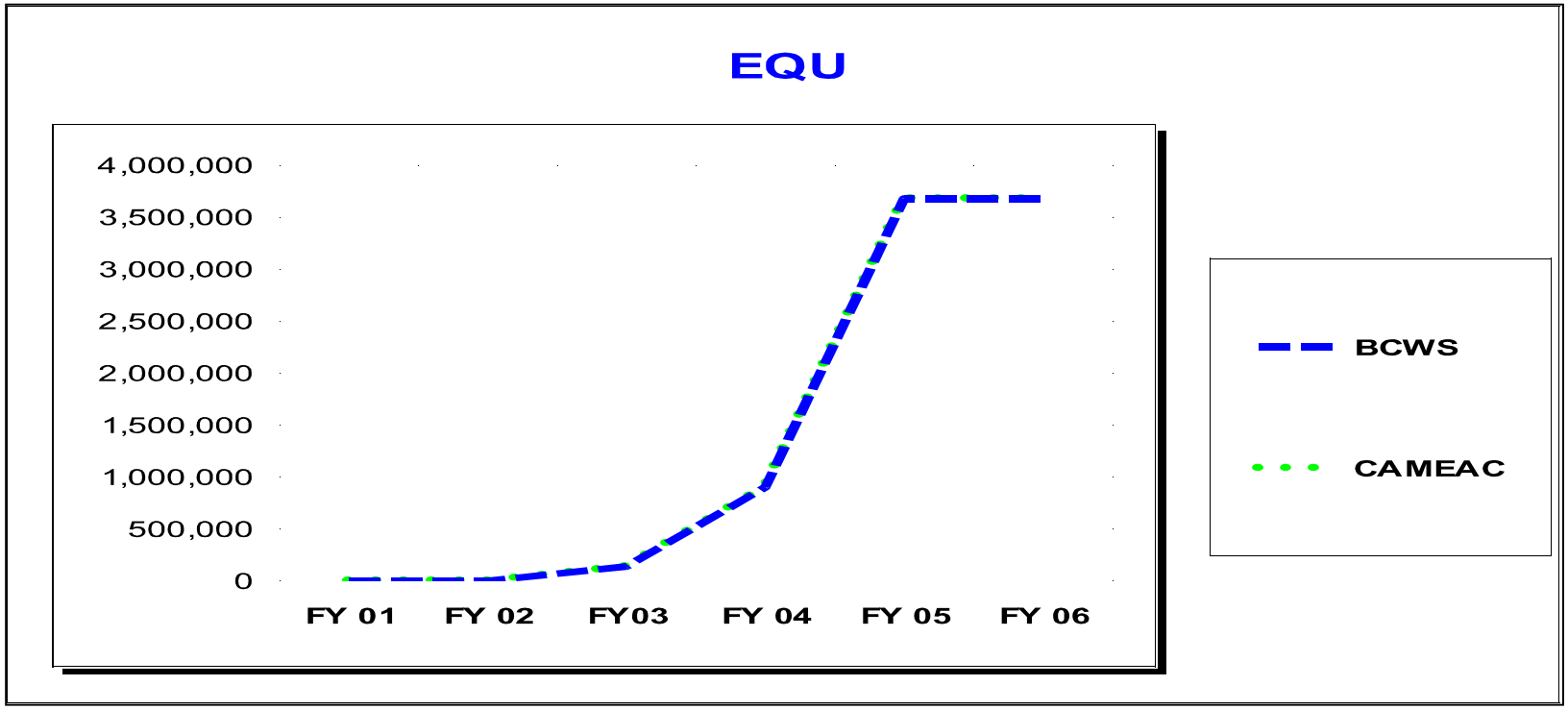
	FY 01	FY 02	FY03	FY 04	FY 05	FY 06
BCWS	0	0	1,320,574	5,834,323	11,402,793	12,076,026
BCWP	0	0	10,272			
CAMEAC	0	0	1,320,574	5,790,596	11,344,214	12,017,447

CDF Calorimeter Curve - 3/13/2003



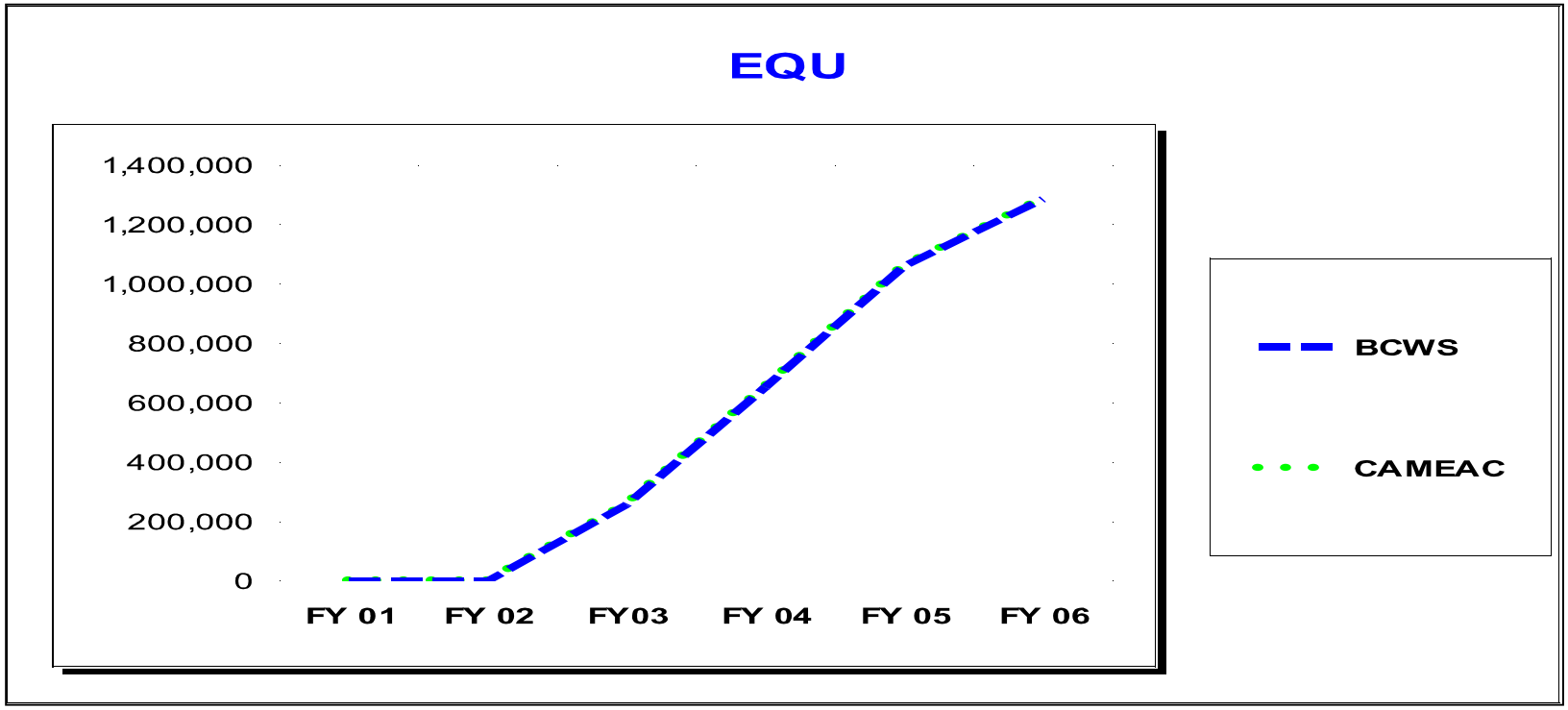
	FY 01	FY 02	FY03	FY 04	FY 05	FY 06
BCWS	0	0	151,360	340,295	341,723	341,723
CAMEAC	0	0	151,360	340,295	341,723	341,723

CDF Trigger/DAQ Curve - 3/13/2003



	FY 01	FY 02	FY03	FY 04	FY 05	FY 06
BCWS	0	0	138,754	901,560	3,676,845	3,676,845
CAMEAC	0	0	138,754	901,560	3,676,845	3,676,845

CDF Administrative Curve - 3/13/2003



	FY 01	FY 02	FY03	FY 04	FY 05	FY 06
BCWS	0	0	256,562	652,013	1,059,898	1,285,349
CAMEAC	0	0	256,562	652,013	1,059,898	1,285,349

VII. VARIANCE ANALYSIS

Cost variances in excess of $50K at level 3 in the WBS will be discussed in this section. To date, no earned value calculation has been performed on equipment funds, so there is no variance discussion needed this month.

VIII. FUNDING PROFILES

The following table contains the funding plan for the project. Specific information relating to spending profiles for the current fiscal year is available above in Section VI, Earned Value.

	2002	2003	2004	2005	2006	Totals
US - M&S	$ 2,750,000	$ 1,580,000	$ 5,292,456	$ 7,073,262	$ 242,418	$ 16,938,135
US - Labor	$ 250,000	$ 1,250,000	$ 1,989,300	$ 2,607,789	$ 651,352	$ 6,748,441
US - G&A	$ 500,000	$ 639,000	$ 1,114,182	$ 1,616,354	$ 219,344	$ 4,088,880
US - Equip. Total	$ 3,500,000	$ 3,469,000	$ 8,395,938	$ 8,508,623	$ 1,113,114	$ 24,986,676
US - R&D	$ 1,670,000	$ 480,000				$ 2,150,000
Japan	$ 235,465	$ 867,229	$ 1,080,700	$ 9,600	$ -	$ 2,192,994
Italy	$ 64,506	$ 350,838	$ 260,946	$ -	$ -	$ 676,290
University	$ 23,557	$ 224,780	$ 103,030	$ 26,040	$ -	$ 377,407
Total Funding	$ 5,493,528	$ 5,391,847	$ 9,840,614	$ 8,544,263	$ 1,113,114	$ 30,383,366

This is the funding profile submitted to the DOE Office of Science in the Project Execution Plan, and dates from the External Independent Review (November, 2002).