28 April 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: Run IIb CDF Detector Project March 2003 Report - REVISED

Attached is the monthly report summarizing the March 2003 activities and progress for the Fermilab RunIIb CDF Detector Project. This report is available electronically at:

http://www-cdf.fnal.gov/run2b.html

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RunIIb CDF Detector Project
Progress Report No. 4
1 - 31 March 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.

The off-line computing hardware and reconstruction software must be enhanced to assure efficient and timely data analysis and production of physics results from the large amount of information that will be accumulated during Run II. Off-line computing and software are managed as a separate project and will be discussed in a separate document. Additional technical detail appears in the CDF Run IIb Detector Technical Design Report.

The installation activities for the Run IIb Detector will be managed as a separate project. Installation will include removing the central detector from the collision hall, extracting the ISL/SVXII detectors from the tracking volume, installing the replacement silicon into the ISL, returning the central detector to the collision hall, and installation of new cabling as required.

II. OVERVIEW OF PROJECT STATUS – P. Lukens

March 2003 was the first full month that equipment funding for the project was available. Requisitions for the SVX4 chip, the silicon sensors, and the preproduction prototype hybrids were signed by Fermilab management in March. The SVX4 chip submission is on the critical path for the Project and schedule delays have reduced the available contingency on the Project from 44 weeks to 33 weeks. We are confident that some of this contingency time can be regained by dropping the next submission of the chip. The design changes introduced in this version of the SVX4 were minor enough that the managers believe this version of the chip will correspond to the production chip. The strategy for the chip submission will be determined after this version has been sufficiently tested – likely to be in late summer. The events that contributed to the delay in the submission include both technical and procurement components. Effort will be made to avoid these delays in future acquisitions.

The status of the schedule shown in this report contains our knowledge of the SVX4 submission as it was in March. Since that time, the purchase order for the SVX4 has been placed (4 April). We anticipate submission of change control for this, and a schedule for next month that contains the adjustments needed.

Prototype work on all subprojects is proceeding well. The silicon detector hybrid development is well advanced. Silicon stave and module prototypes are operational and being tested. Engineering on the mechanical structures is moving ahead with good progress.

Project tracking with earned value calculations on equipment are included in this report for the first time. The Budgeted Cost of Work Scheduled (BCWS) is contained in the Cost Performance Report, and reflects our current best estimate of future costs of the project. It should be noted that the contingency available to the Project is now estimated to be $7,607K, down from $7,853K. This change is due to several effects. The most significant impact is the result of our financial reporting on procurements that will be paid by our foreign collaborators through the Fermilab procurement process. These purchases are treated as though they are funded by DOE in the reporting system currently used (COBRA). Consequently, all such items appear in our Cost Performance Report as included in the DOE BCWS. Additional adjustments to the scheduled costs of the Project are due to the more sophisticated, and presumably more reliable, estimates provided by the COBRA financial package. Escalation, fringe benefit calculations, and labor rates are handled better, and give a different overall cost for the labor on the project. We plan to implement the formal Change Control process to reflect this situation, and then again in the future when we are reimbursed for the costs covered by foreign collaborators.

III. PROJECT MILESTONE SUMMARY

CDF Level 2 Schedule Milestones from the Resource Loaded schedules

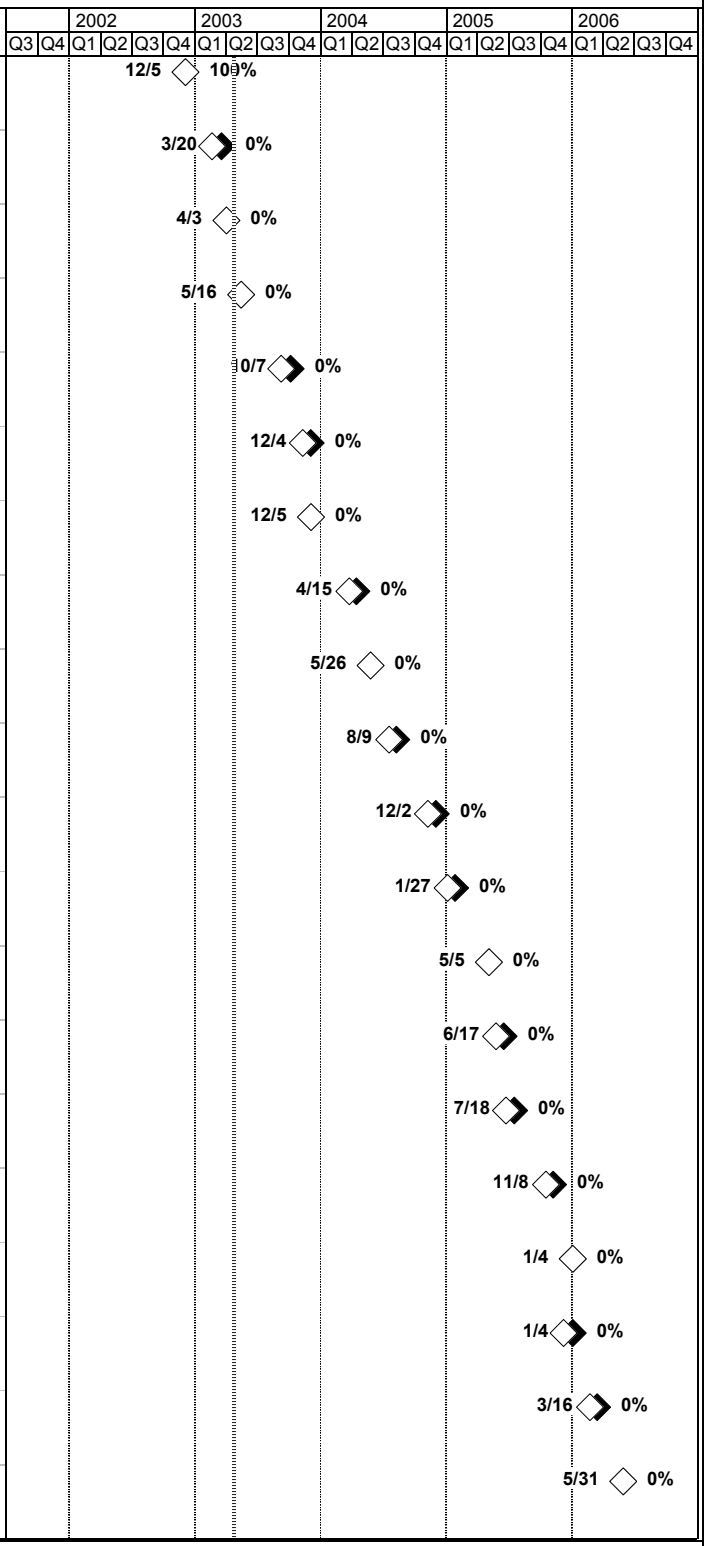
WBS	Title	Baseline Completion Date	Forecast/Actual Completion Date	Complete
1.1.5.4.1.13	Prototype stave #1 complete	5-Dec-02	5 Nov 02	Yes
1.1.2.1.2.4	2nd chip submission	20-Feb-03	20-Mar-03	No
1.1.2.10.2.4	Testing #1 complete- go ahead for #2	3-Apr-03	3-Apr-03	
1.3.3.2.3.4	Begin fabrication of Prototype 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	28-Feb-03	Yes
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	28-Feb-03	Yes
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	28-Feb-03	Yes
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	

Milestone list continues on following page

WBS	Title	Baseline Completion Date	Forecast/Actual Completion Date	Complete
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	
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**
219	**2nd chip submission**
293	**Testing #1 complete- go ahead for #2**
43	**Production Sensor submission**
231	**Production chip submission**
298	**Go ahead for Preproduction**
704	**All tests of stave installation, screen mounting, complete**
380	**Preproduction hybrid available**
66	**L0 prototype modules complete**
305	**Go ahead for DAQ production**
390	**Production hybrid available**
102	**Production module available**
626	**L0 Supports Complete**
150	**100 Production staves complete**
714	**Stave Installation Begins**
155	**Production staves complete**
697	**Inner detector complete**
719	**Stave Installation Complete**
727	**Outer detector complete**
736	**SVX2b Ready for Installation into ISL**

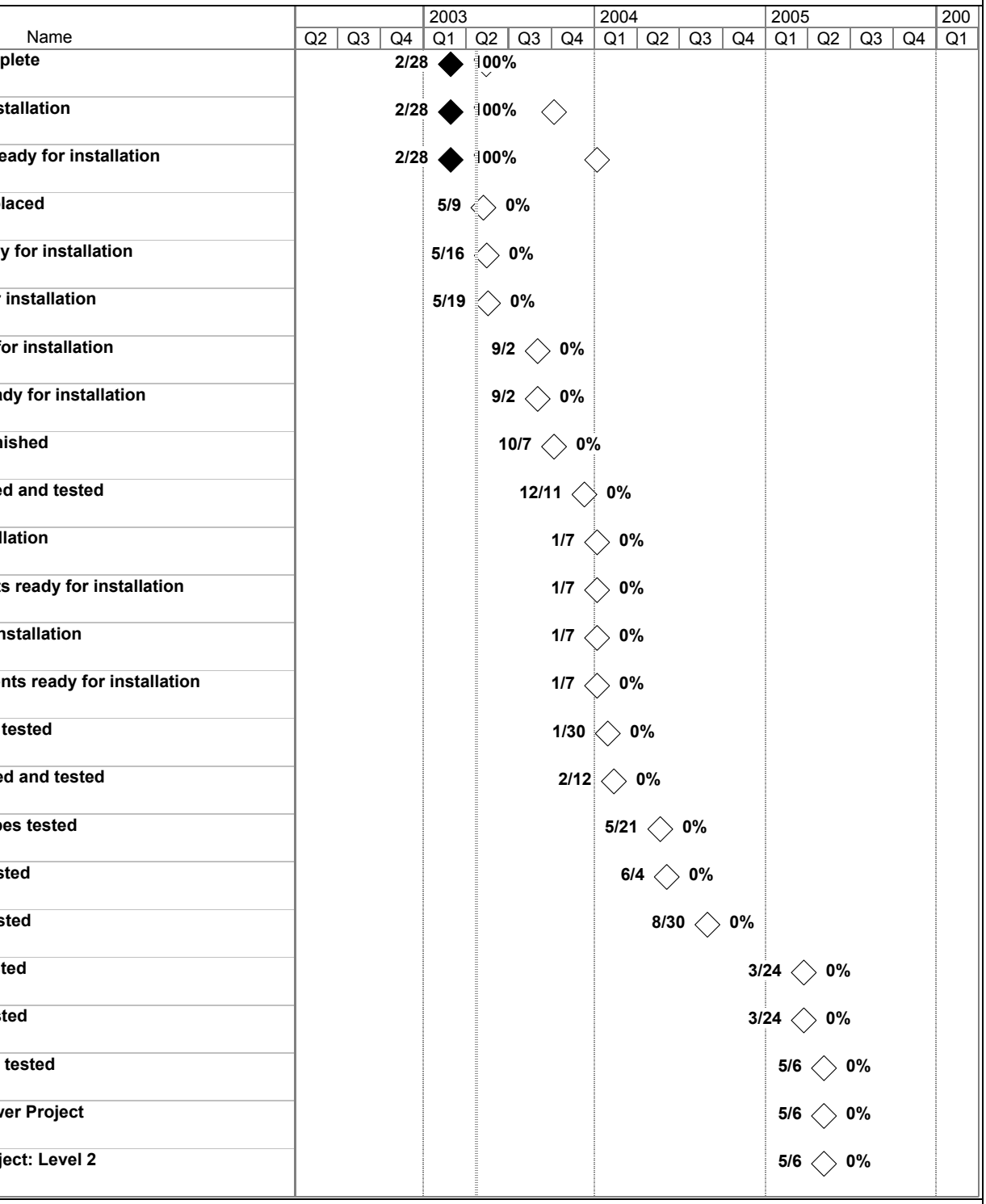


Project: CDF Run2b Silicon
Date: Apr 23 '03

Task		Baseline Summary	
Progress		Rolled Up Baseline	
Baseline		Rolled Up Baseline Milestone	
Milestone		Rolled Up Progress	
Baseline Milestone		Split	
Summary		External Tasks	
Rolled Up Task		Project Summary	
Rolled Up Milestone			

CDF Run2b Calorimeter Level 2 Milestones

ID	Name	
39	**Prototype Testing Complete**	2/28 100%
40	**VME Crate ready for installation**	2/28 100%
41	**Upstairs components ready for installation**	2/28 100%
106	**First phototube order placed**	5/9 0%
42	**ASD->TDC Cables ready for installation**	5/16 0%
43	**CEM Splitters ready for installation**	5/19 0%
44	**PEM Harnesses ready for installation**	9/2 0%
45	**All cables done and ready for installation**	9/2 0%
107	**1st WLS fiber holder finished**	10/7 0%
108	**1st CPR module finished and tested**	12/11 0%
46	**ASD/TB ready for installation**	1/7 0%
47	**Downstairs components ready for installation**	1/7 0%
48	**TDC boards ready for installation**	1/7 0%
49	**All EMTiming components ready for installation**	1/7 0%
109	**First set of phototubes tested**	1/30 0%
110	**1st 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%

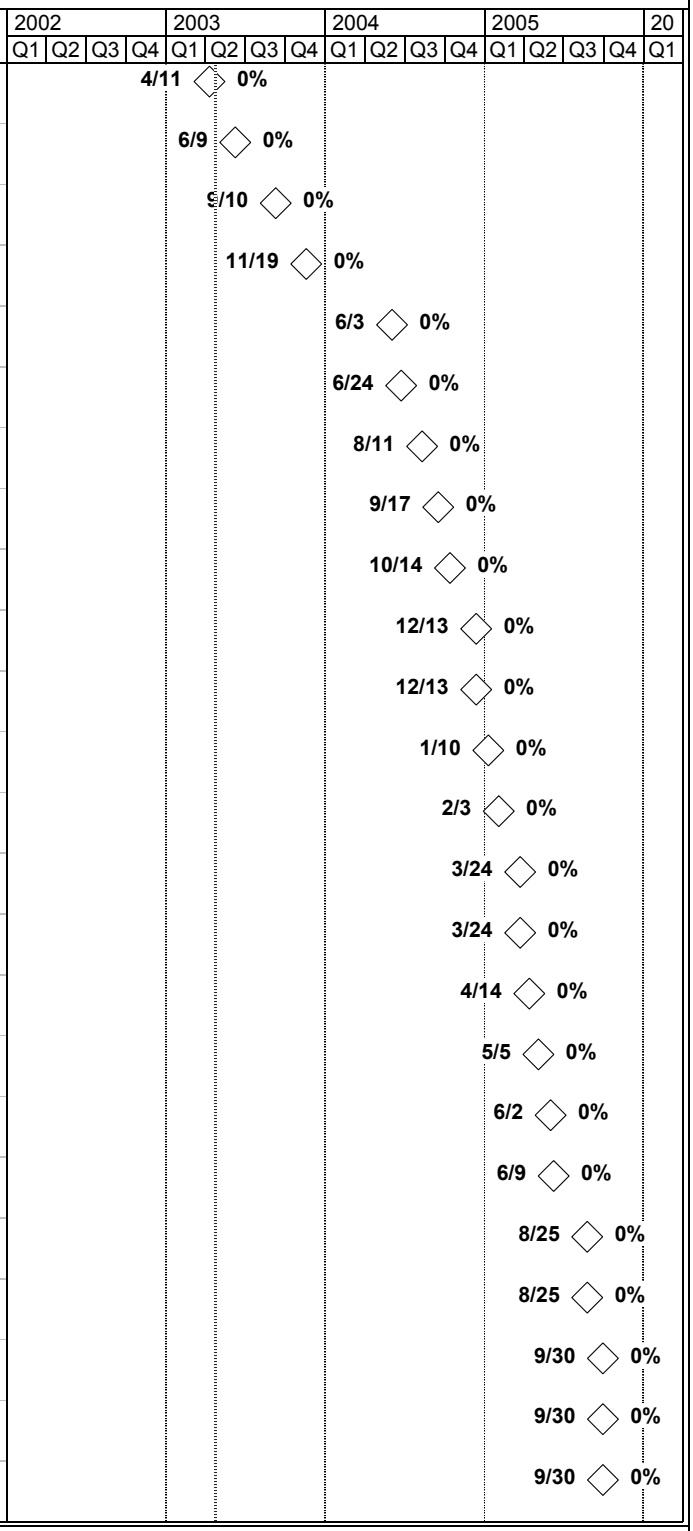


Project: CDF RunIIb Calorim
Date: Apr 23 '03

Task
Progress
Baseline
Milestone
Baseline Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Baseline Summary
Rolled Up Baseline
Rolled Up Baseline Milestone
Rolled Up Progress
Split
External Tasks
Project Summary

CDF Run2b Trigger/DAQ Level 2 Milestones

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



Project: CDF Run 2B Data A
Date: Apr 23 '03

Task		Baseline Summary	
Progress		Rolled Up Baseline	
Baseline		Rolled Up Baseline Milestone	
Milestone		Rolled Up Progress	
Baseline Milestone		Split	
Summary		External Tasks	
Rolled Up Task		Project Summary	
Rolled Up Milestone			

IV. PROCUREMENT – P. Lukens

There were no major requisitions submitted this month. The SVX4 chip, and sensors were delayed due to procurement issues. While the purchase orders were generated and approved in March, they were not released by Fermilab prior to the end of the month. Issues involving satisfaction of the Buy American Act caused some unforeseen delays in these orders. These will be addressed earlier in future procurements through foreign vendors.

V. PROJECT HIGHLIGHTS

1.1 – Silicon Detector

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

The engineering for the SVX4 chip was finished last month and the files were submitted to the vendor in Taiwan, Taiwan Semiconductor Manufacturing Company (TSMC), for review. This month we have been working with procurement to satisfy the requirements of the Buy American Act. The package is awaiting the appropriate approvals. The SVX4 chip is the critical path item for the project. If the PO is issued May 1st, the contingency on the project will be 30 weeks. We anticipate that this chip will be the final production chip and thus some time can be gained later in the schedule by skipping the design and engineering tasks of the production chip submission.

Good progress was made on the Miniport cards. The Polyamide version was submitted and a final review of the BeO version is scheduled for early April. The PO is already in place and we anticipate having both versions available for testing this summer.

Several prototype Layer Zero (L0) modules were sent out to be assembled by an outside contractor and are expected back at Fermilab near the middle of April.

1.1.3 Sensors – Brenna Flaugher, Nicola Bacchetta

The requisitions for the production sensors were submitted in February after approval of the sensor review. Although the vendor for the sensors (Hamamatsu) views the CDF order as one package, the sensors are actually ordered in two pieces. One piece is ordered directly by our collaborators at the University of Tsukuba and the other piece is ordered through Fermilab. The Tsukuba order has already been placed and we expect delivery of the first production sensors in June. The documentation for the Fermilab order is being finalized. Work is beginning to prepare a database to handle the sensors when they begin to arrive.

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

Stave 3 was completed and delivered for testing. Construction of additional modules and staves will proceed when the need arises.

1.1.6 Support Mechanics – Brenna Flaugher, Nicola Bacchetta

Studies with the bulkhead assembly fixture were performed. Small modifications to the design were identified which would facilitate assembly of future bulkheads.

Finite Element Analysis of the Spacetube continued to make progress towards a final design.

There is good progress towards a prototype barrel assembly fixture. Design of the components has been completed and parts are being fabricated.

Tubing for the Layer Zero cooling system was received at Fermilab. Testing will begin in April 2003.

1.2 – Calorimeter

1.2.1 Central Preshower and Crack Detector – Steve Kuhlmann

The Central Preshower/Crack Upgrade continued to make progress in March on many fronts. The first sets of fibers were mirrored at Fermilab in Village Lab 7 and then spliced to clear fibers in Lab 5. Two sets were delivered to Michigan State University for pigtail production. Other sets were sent to Argonne National Lab and Pisa for more Research and Development studies. Argonne finished the first Crack detector mechanical prototype with good results. INFN performed uniformity studies with different preshower groove types. Numerous other details, relating to the assembly of the first preshower full-scale prototype, were addressed during the past month. This is scheduled to take place during April 2003.

1.2.2 Electromagnetic Timing – Dave Toback

March 2003 saw the beginning of production of the PEM harnesses. They are now 70% done. We began on the PEM harnesses instead of the CEM harnesses first for operational reasons so the two schedules should be swapped. We believe both will be done by the schedule for the PEM harness time. The on-detector integration of the CEM splitters and PEM wedges into normal data continues to go well as we improve calibrations and monitoring.

All of the parts for the TDC crate have been installed, and the cabling connections to the rest of the TDC system are now done. Integration and final testing of the crate is expected in the next month. We have a number of TDC's in hand and have begun to test them for use in our system. The long cables have not been ordered as we are checking into a recent idea for a better cable. While this sets back that particular line, it does not affect the overall schedule. 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

1.3.1 TDC (Time to Digital Converter) – Henry Frisch, Ting Miao

We are continuing with work to define the readout protocol suitable for the high speed readout path of new TDCs. Significant progress was made on understanding the communication interface requirements between TDC crates, trigger supervisor, and the event builder. The specifications that were agreed upon are now being implemented. Prototype work is in the early stage of planning. People continue to work on defining the XFT

interface and the VME interface. The VME interface must support the multi-board super block transfer. Selection of the operating system for the readout PC is still under discussion.

1.3.2 Level 2 – Ted Liu, Peter Wittich

Testing of Level 2 data pathways is being conducted at Fermilab. No problems or delays have been experienced and we expect progress to continue smoothly. No other work is scheduled to begin until later in fiscal year 2003.

1.3.3 XFT (eXtremely Fast Tracker) II – Richard Hughes, Brian Winer

The Linker upgrade work at OSU has been focused on implementing the improved tracking linking algorithm in the latest Altera Stratix devices. We have fit the design into the target device (an EP1S25), but we are struggling with trying to pass a set of test vectors through the Altera simulator. We have successfully tested smaller portions of the design with the simulator, but not yet the full design.

1.3.4 Event Builder – Christoph Paus

A Gigabit prototype system has been constructed and a technical evaluation is underway. The prototype will be monitored for satisfactory operation over the next month. No other work is scheduled to begin until much later in calendar year 2003.

1.3.6 SVT (Silicon Vertex Tracker) – Bill Ashmanskas, Luciano Ristori

No work is scheduled to begin on the Silicon Vertex tracker trackfitter and merger boards until early in calendar year 2004.

VI. FINANCIAL STATUS

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.

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 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 (columns 2-6) as well as the project to date (columns 7-11). Column 12 contains our current value of BAC, and will only be changed after the formal implementation of the Change Control process. Column 13 contains the LRE, and column 14 the VAC.

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.

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 estimated total cost of the project when completed. It is equivalent to the BCWS at completion and is contained in column 12 of the **Cost Performance Report**.

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 sum of the budgets for all planned work to be accomplished within a given time period.

CPI – Cost Performance Index. $CPI = \frac{BCWP}{ACWP}$

CV – Cost Variance. $CV = BCWP - ACWP$

EAC – Estimate At Completion. This is the ACWP to date, plus the BCWS of remaining tasks. $EAC = (BAC - BCWP) + ACWP$

EV – Earned Value. $EV = BCWP$

ETC – Estimate to Completion. $ETC = EAC - ACWP - Contingency$

LRE – Latest Revised Estimate. This is the same as EAC but LRE is used on the Project Cost Performance Report from COBRA. $LRE = (BAC - BCWP) + ACWP$

Percent Complete - $\%Com = \frac{BCWP}{BAC}$

SPI – Schedule Performance Index. $SPI = \frac{BCWP}{BCWS}$

SV – Schedule Variance. $SV = BCWP - BCWS$

VAC – Variance at Completion. Included in column 14 of the **Cost Performance Report.** $VAC = BAC - EAC$

CDF Project Variance Analysis Report

Reporting Period: 2/28/2003 3/31/2003

	BCWS	BCWP	ACWP	SV in $	SV in %	CV in $	CV %	SPI	CPI
Current:	159,588	111,870	59,700	-47,717	-30%	52,170	47%	0.70	1.87
Cumulative:	159,588	122,143	59,700	-37,445	-23%	62,443	51%	0.77	2.05
	BAC	EAC	VAC in $	VAC in %	CPI to BAC	CPI to EAC			
At Complete:	17,379,944	17,304,918	75,026	0%	1.00	1.00			

Explanation of Variance/Description of Problem:

Impact:

Corrective Action:

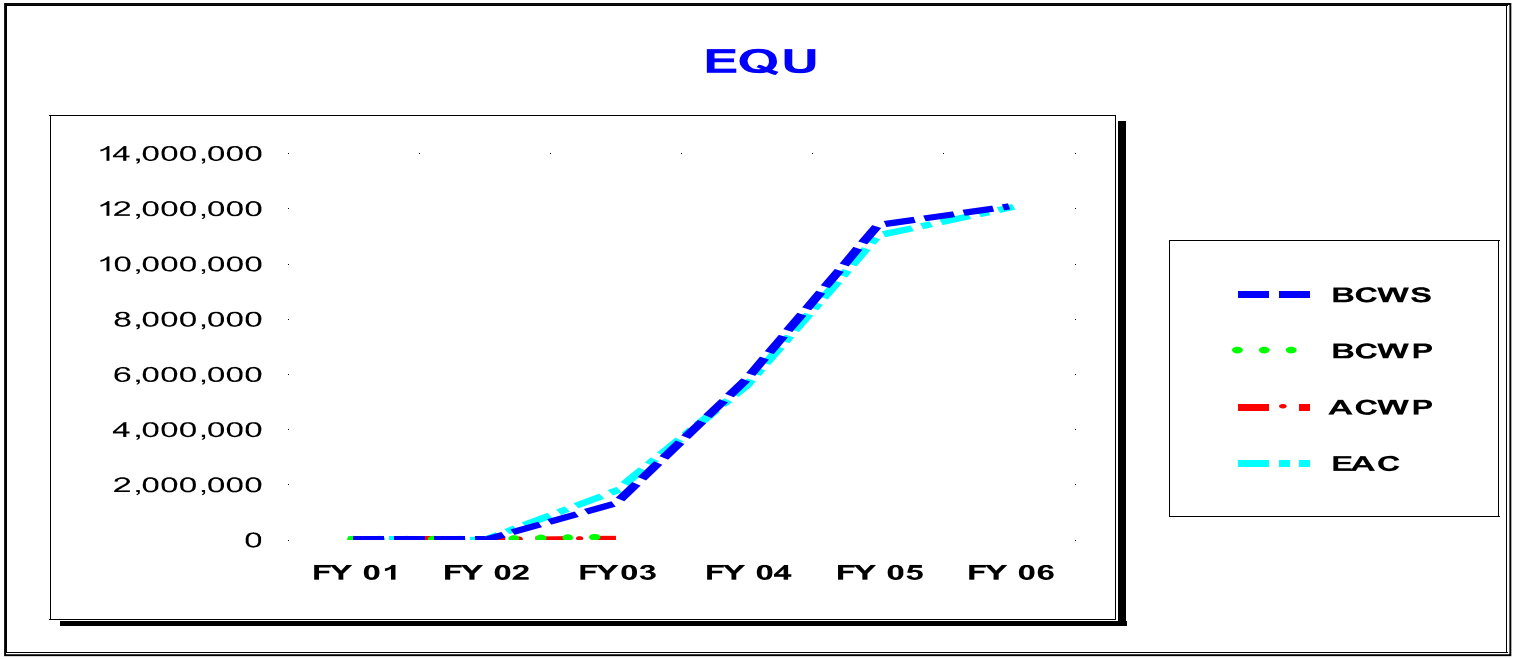
Monthly Summary (to include technical causes of VARs, Impacts) and Corrective Action(s):

Prepared by: Date: Approved by: Date:

EQU Cost Performance Report - Work Breakdown Structure Level 3

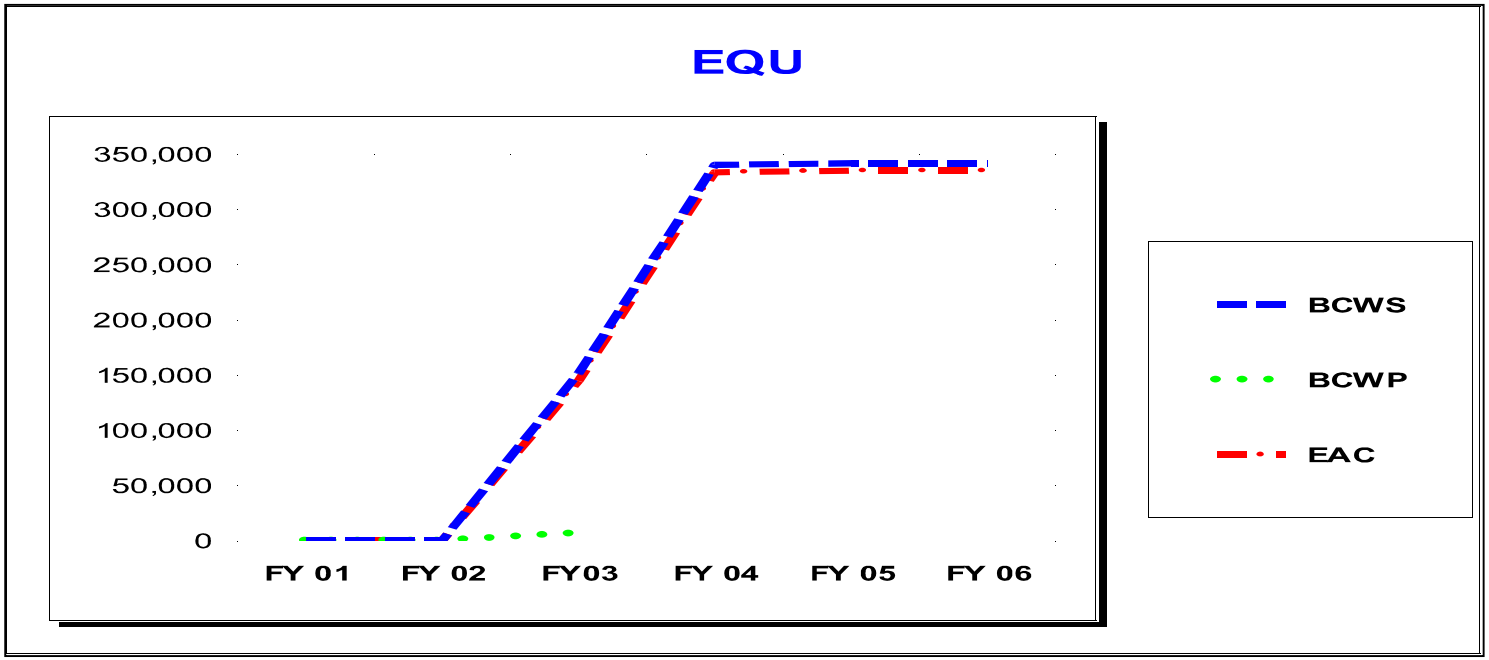
Cost Performance Report - Work Breakdown Structure														
Contractor: Location:						Contract Type/No:			Project Name/No: CDF RIIb Master EQU S		Report Period: 2/28/2003	3/31/2003		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work			Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	24,987,050		0			0	0	24,987,050	0		0	0		
Funding Type-CA	Current Period					Cumulative to Date						At Completion		
WBS[2] WBS[3]	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance				Latest Revised	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	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	10,852	13,023	0	2,171	13,023	10,852	13,023	0	2,171	13,023	461,456	448,607	12,848	
1.1.2 DAQ	20,463	15,695	1,200	-4,768	14,495	20,463	21,766	1,200	1,303	20,566	5,307,465	5,282,472	24,993	
1.1.3 Sensors	3,083	0	0	-3,083	0	3,083	0	0	-3,083	0	874,755	864,875	9,881	
1.1.4 Cooling and Monitoring	12,904	0	0	-12,904	0	12,904	0	0	-12,904	0	464,851	464,536	315	
1.1.5 Construction of Modules, Staves and L0	0	0	0	0	0	0	0	0	0	0	2,141,524	2,156,982	-15,459	
1.1.6 Support Mechanics	41,884	40,322	33,700	-1,561	6,622	41,884	44,524	33,700	2,640	10,824	2,825,975	2,806,117	19,858	
WBS[2]Totals:	89,186	69,040	34,900	-20,145	34,140	89,186	79,313	34,900	-9,873	44,413	12,076,026	12,023,590	52,436	
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	9,237	6,730	0	-2,507	6,730	9,237	6,730	0	-2,507	6,730	35,630	28,900	6,730	
WBS[2]Totals:	9,237	6,730	0	-2,507	6,730	9,237	6,730	0	-2,507	6,730	341,723	334,986	6,737	
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	25,718	0	0	-25,718	0	25,718	0	0	-25,718	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:	25,718	0	0	-25,718	0	25,718	0	0	-25,718	0	3,676,845	3,676,845	0	
1.4 Administration														
1.4.3 Construction Phase	35,446	36,100	24,800	654	11,300	35,446	36,100	24,800	654	11,300	1,285,349	1,269,497	15,852	
WBS[2]Totals:	35,446	36,100	24,800	654	11,300	35,446	36,100	24,800	654	11,300	1,285,349	1,269,497	15,852	
Funding Type-CATotals:	159,588	111,870	59,700	-47,717	52,170	159,588	122,143	59,700	-37,445	62,443	17,379,944	17,304,918	75,026	
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0	0	
Undist. Budget											0	0	0	
Sub Total	159,588	111,870	59,700	-47,717	52,170	159,588	122,143	59,700	-37,445	62,443	17,379,944	17,304,918	75,026	
Management Resrv.											7,607,106	7,607,106	0	
Total	159,588	111,870	59,700	-47,717	52,170	159,588	122,143	59,700	-37,445	62,443	24,987,050	24,912,024	75,026	

CDF Silicon Detector Curve - 4/23/2003



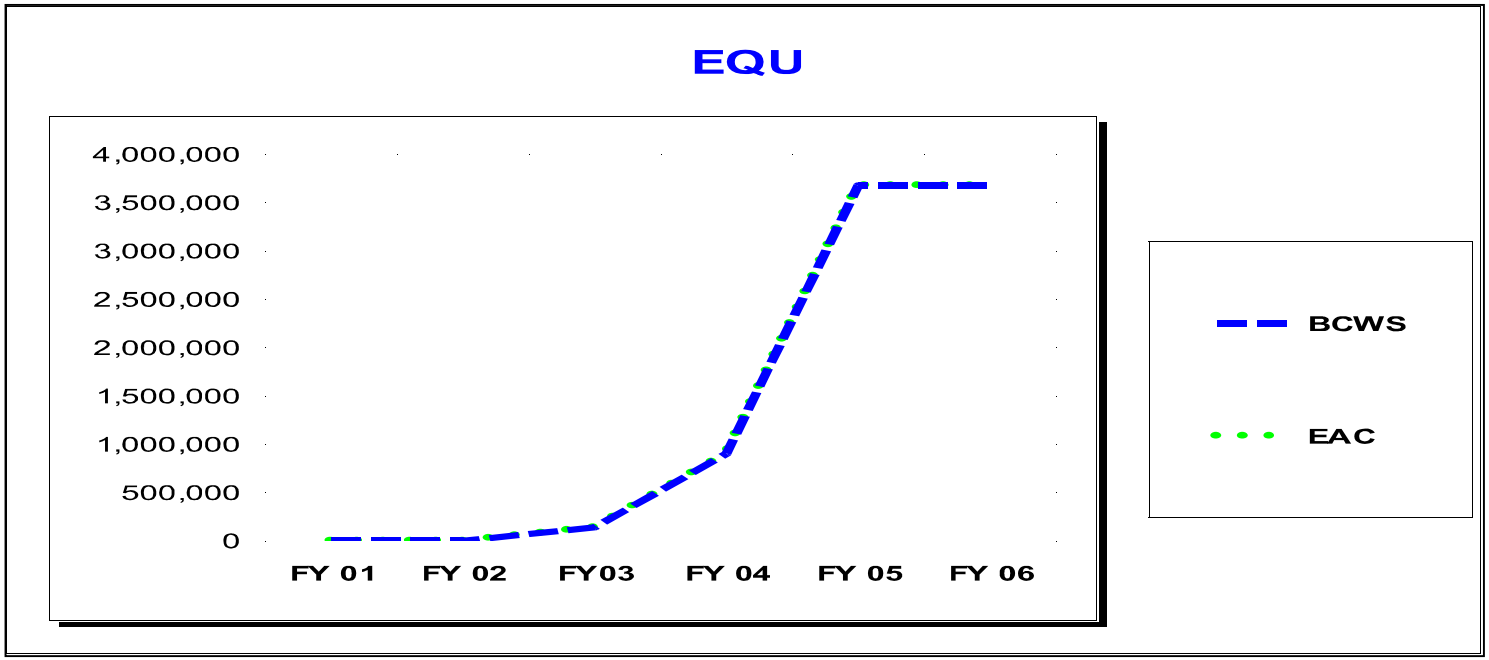
	FY 01	FY 02	FY03	FY 04	FY 05	FY 06
BCWS	0	0	1,320,574	5,834,323	11,402,793	12,076,026
BCWP	0	0	79,313			
ACWP	0	0	34,900			
EAC	0	0	1,777,080	5,607,652	11,026,136	12,023,590

CDF Calorimeter Curve - 4/15/2003



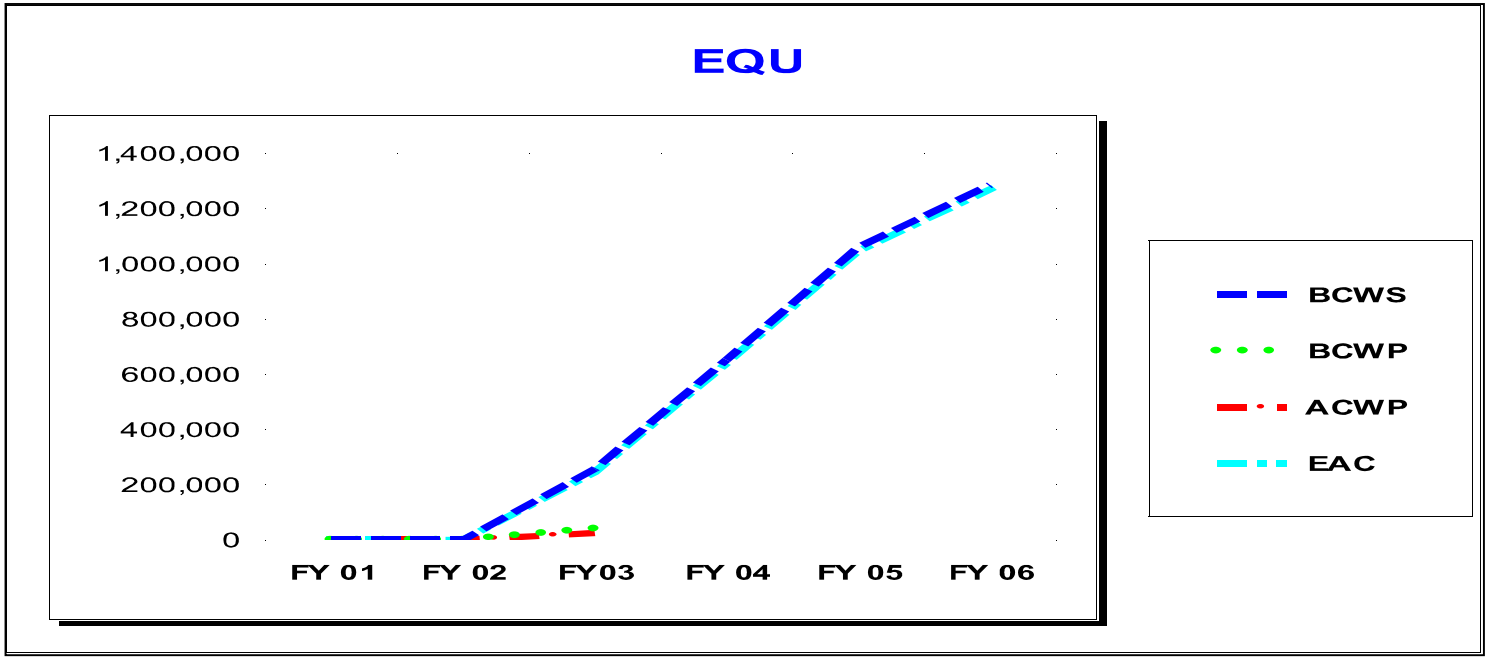
	FY 01	FY 02	FY03	FY 04	FY 05	FY 06
BCWS	0	0	151,360	340,295	341,723	341,723
BCWP	0	0	6,730			
EAC	0	0	144,629	333,557	334,986	334,986

CDF Trigger/DAQ Curve - 4/15/2003



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

CDF Administration Curve - 4/23/2003



	FY 01	FY 02	FY03	FY 04	FY 05	FY 06
BCWS	0	0	256,562	652,013	1,059,898	1,285,349
BCWP	0	0	40,364			
ACWP	0	0	24,800			
EAC	0	0	245,324	639,426	1,045,915	1,269,497

VII. VARIANCE ANALYSIS – P. Lukens

Cost variances in excess of $50K at level 3 in the WBS will be discussed in this section. No variance of this level is present at this time.

VIII. FUNDING PROFILES

The table, below, contains the funding plan for the Project. Specific information relating to spending profiles for the current fiscal year is available above in Section VI, Financial Status. This is the funding profile submitted to the DOE Office of Science in the Project Execution Plan (PEP).

	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	$ 210,000	$ 1,290,000	$ 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	$ 3,460,000	$ 3,509,000	$ 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	$ 5,453,528	$ 5,431,847	$ 9,840,614	$ 8,544,263	$ 1,113,114	$ 30,383,366

The following table contains current values for selected financial tracking quantities that do not appear in the Cost Performance Report.

	Current period	Cumulative to date
Estimate to Completion	$17,245K	$17,245K
Percent Complete	0.045%	0.045%