

24 November 2004

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 October 2004 Report

Attached is the monthly report summarizing the October 2004 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. 23
1 - 31 October 2004

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 increased size of the data sample will 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:

- 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

Although not strictly within the scope of the project, the installation of the calorimeter upgrades is now in complete. This installation was completed on 8 November. No shutdown time was needed beyond the schedule set by the accelerator division for their work. The upgraded preshower system and electromagnetic timing systems will be included in the data for all future operation.

Other project have slipped somewhat, but are making steady progress. Our current projection is that portions of the project that require a shutdown of the experiment and access to the collision hall will be complete by 4 August 2005.

III. PROJECT MILESTONE SUMMARY (as of 31 October 2004)

CDF Data Acquisition & Trigger (L1 and L2) Milestones Sorted by Baseline Completion Date

WBS	Title	Baseline Comp. Date	Forecast/Actual Completion Date	Complete
1.3.2.6.3	Begin production of Level 2 Pulsar system	12 Nov 03	12 Nov 03	Yes
1.3.1.6.6	First Prototype TDC available for testing	19-Nov-03	16-Feb-04	Yes
1.3.4.4.1.4	Prototype Event Builder hardware arrives	3-Jun-04	31 Mar 04	Yes
1.3.2.10	Pulsar Hardware Ready for Installation	31-Aug-04	20-Aug-04	Yes
1.3.6.1.1.7	Begin AMS Design Work	1-Sept-04	2-Aug-04	Yes
1.3.6.1.3.7	Begin Track Fitter Design	1-Sept-04	2-Aug-04	Yes
1.3.4.5.3	Production Readiness Review - Event Builder	4-Oct-04	2-Jun-04	Yes
1.3.4.5.4.4	Arrival of the Event Builder hardware	15-Oct-04	15-Oct-04	Yes
1.3.11.8.5.5	Begin Purchase of Pulsar Board components	20-Oct-04	4-Nov-04	
1.3.11.5.3.8	Begin Production TDC Mezzanine Card	28-Oct-04	3-Nov-04	
1.3.6.2.6.4	Begin Ampchip Production	10-Jan-05	22-Nov-04	
1.3.6.2.1.1.5	Begin AMS Mezzanine Card Production	14-Jan-05	11-Nov-04	
1.3.11.6.3.6	All TDC to Finder cables Received	18-Mar-05	4-Mar-05	
1.3.5.3.7	Arrival of 15 PCs from the vendor	23-Mar-05	23-Feb-05	
1.3.2.9	Pulsar Level 2 subproject ready for installation	1-Apr-05	28-Feb-05	
1.3.11.8.8	Begin Joint Testing with Finder Board	4-Apr-05	14-Mar-05	
1.3.11.7.5.8	Begin Production of SLAM Boards	18-Apr-05	22-Mar-05	
1.3.11.4.4.8	Begin Production TDC Fiber Transition Boards	21-Apr-05	22-Mar-05	
1.3.1.17.4	TDC Readout System Complete	6-Jun-05	17-Dec-04	
1.3.11.5.3.9	Checkout of TDC Mezzanine Cards Complete	6-Jun-05	20-Apr-05	
1.3.11.2.5.1	Begin Production XFT Finder Boards	8-Jun-05	26-Apr-05	
1.3.6.1.2.5	Hit Buffer Firmware Complete	23-Jun-05	25-Feb-05	
1.3.6.1.3.5	Track Fitter Firmware Complete	28-Jun-05	2-Mar-05	
1.3.4.8	Finish Event-Builder Upgrade	28-July-05	29-Jun-05	
1.3.5.5.5	Arrival of 70 Level3 and 15 DAQ PCs	15-Aug-05	15-Aug-05	
1.3.5.6.5	Arrival of 140/20 PCs from the vendor	15-Aug-05	15-Aug-05	
1.3.6.1.1.5	AMS Firmware Complete	19-Aug-05	2-Feb-05	
1.3.6.3	SVT ready for installation	25-Aug-05	15-July-05	
1.3.5.8	Finish Purchase of Computers for L3 DAQ system	6-Sept-05	6-Sept-05	
1.3.11.4.4.9	Checkout of TDC Transition Boards Complete	16-Sept-05	3-Aug-05	
1.3.11.7.5.9	Checkout of SLAM Boards Complete	28-Sept-05	9-Aug-05	
1.3.11.2.5.10	Finder Board Checkout Complete	29-Sept-05	9-Sept-05	
1.3.11.10	XFT Ready for Installation at CDF	29-Sep-05	9-Sep-05	
1.3.1.16	Run 2b TDC Ready for Installation	30-Sep-05	17-Dec-04	
1.3.8	Finish Run 2b Trigger DAQ project	30-Sep-05	9-Sep-05	
1.3.9	DAQ and Trigger Upgrades Ready for Installation	17-Jan-06	9-Sep-05	

Run IIb Data Acquisition & Trigger Milestones (Level 1 and 2)

ID	Name	Forecast	Baseline	Variance	2005				2006			
					Q2	Q3	Q4	Q1	Q2	Q3	Q4	
132	Begin production of Level2 Pulsar system	11/12/03	11/12/03	0 wks								
67	First Prototype TDC available for testing	2/16/04	11/19/03	11.35 wks	★							
299	Arrival of the prototype Event Builder hardware	3/31/04	6/3/04	-9 wks	★	◆						
308	Event Builder Production Readiness Review	6/2/04	10/4/04	-17.2 wks		★	◆					
364	Begin AMS Design Work	8/2/04	9/1/04	-4.4 wks			★	◆				
378	Begin Track Fitter Design	8/2/04	9/1/04	-4.4 wks			★	◆				
142	Pulsar Hardware Ready for Installation	8/20/04	8/31/04	-1.4 wks			★	◆				
313	Arrival of the Event Builder hardware	10/15/04	10/15/04	0 wks				◆				
224	Begin Production TDC Mezzanine Card	11/3/04	10/28/04	0.8 wks				◆				
276	Begin Purchase of Pulsar Board components	11/4/04	10/20/04	2 wks				◆				
389	Begin AMS Mezzanine Card Production	11/11/04	1/14/05	-8.2 wks				◆				
413	Begin Ampchip Production	11/22/04	1/10/05	-5.8 wks				◆				
108	TDC Readout System Complete	12/17/04	1/21/05	-4 wks				◆				
110	Run 2b TDC Ready for Installation	12/17/04	3/2/05	-9.6 wks				◆				
362	AMS Firmware Complete	2/2/05	8/19/05	-28 wks				◆				
329	Arrival of 15 PCs from the vendor	2/23/05	3/23/05	-4 wks				◆				
370	Hit Buffer Firmware Complete	2/25/05	6/23/05	-16.6 wks				◆				
146	Pulsar Level 2 subproject ready for installation	2/28/05	4/1/05	-4.6 wks				◆				
376	Track Fitter Firmware Complete	3/2/05	6/28/05	-16.6 wks				◆				
235	Installation of TDC to Finder cables Complete	3/4/05	3/18/05	-2 wks				◆				
279	Begin Joint Testing with Finder Board	3/14/05	4/4/05	-3.2 wks				◆				
207	Begin Production TDC Fiber Transition Boards	3/22/05	4/21/05	-4.4 wks				◆				
262	Begin Production of SLAM Boards	3/22/05	4/18/05	-3.8 wks				◆				
225	Checkout of TDC Mezzanine Cards Complete	4/20/05	6/6/05	-6.5 wks				◆				
170	Begin Production XFT Finder Boards	4/26/05	6/8/05	-6 wks				◆				
320	Finish Event-Builder Upgrade	6/29/05	7/28/05	-4 wks				◆				
415	SVT ready for installation	7/15/05	8/25/05	-5.8 wks				◆				
208	Checkout of TDC Transition Boards Complete	8/3/05	9/16/05	-6.2 wks				◆				
263	Checkout of SLAM Boards Complete	8/9/05	9/28/05	-7 wks				◆				
344	Arrival of 70 Level3 and 15 DAQ PCs from the vendor	8/15/05	8/15/05	0 wks				◆				
351	Arrival of 140/20 PCs from the vendor	8/15/05	8/15/05	0 wks				◆				
354	Finish Purchase of Computers for Level3/DAQ system	9/6/05	9/6/05	0 wks				◆				
179	Finder Board Checkout Complete	9/9/05	9/29/05	-2.8 wks				◆				
281	XFT Ready for Installation at CDF	9/9/05	9/29/05	-2.8 wks				◆				
417	Finish Run 2b Trigger DAQ project	9/9/05	9/30/05	-2.8 wks				◆				
418	Data Acquisition and Trigger Upgrades Ready for Insta	9/9/05	1/17/06	-16.8 wks				◆				◆

Project: CDF RunIIb DAQ Status Date: 10/29/04 Print Date: 11/23/04	Completed Milestone ★	Current Forecast ◇	Baseline Milestone ◆
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**CDF Calorimeter Level 1 and Level 2 Milestones
Sorted by Baseline Completion Date**

WBS	Milestone	Baseline Completion Date	Forecast/Actual Completion Date	Complete
1.2.1.10.1	First phototube order placed	9-May-03	1-Apr-03	Yes
1.2.2.2.7.1	Prototype testing complete	16-May-03	28-Mar-03	Yes
1.2.2.2.7.4	ASD->TDC Cables ready for installation	16-May-03	26-Aug-03	Yes
1.2.2.2.7.2	CEM Splitters ready for installation	19-May-03	29-Jul-03	Yes
1.2.2.2.7.3	PEM Harnesses ready for installation	2-Sep-03	28-Apr-03	Yes
1.2.2.2.7.5	All EMT cables done and ready to install	2-Sep-03	26-Aug-03	Yes
1.2.2.2.7.8	VME Crate ready for installation	7-Oct-03	30-Apr-03	Yes
1.2.1.10.3	First set of Calorimeter phototubes tested	20-Oct-03	20-Oct-03	Yes
1.2.2.2.7.10	Upstairs components ready to install	7-Jan-04	16-Oct-03	Yes
1.2.2.2.7.11	All EM Timing components ready to install	7-Jan-04	16-Oct-03	Yes
1.2.2.2.7.6	ASD/TB ready for installation	7-Jan-04	16-Oct-03	Yes
1.2.2.2.7.7	Downstairs components ready to install	7-Jan-04	16-Oct-03	Yes
1.2.2.2.7.9	TDC boards ready for installation	7-Jan-04	16-Oct-03	Yes
1.2.1.10.2	1 st Calorimeter WLS fiber holder finished	1-Apr-04	17-Feb-04	Yes
1.2.1.10.4	1 st CPR module finished and tested	4-Jun-04	15-Mar-04	Yes
1.2.1.10.6	1 st CCR module finished and tested	19-Jul-04	2-Mar-04	Yes
1.2.1.10.5	2 nd set of Calorimeter phototubes tested	6-Aug-04	26-Mar-04	Yes
1.2.1.10.7	50% Calorimeter CPR Detectors Tested	14-Jan-05	30 June 04	Yes
1.2.1.10.8	50% Calorimeter CCR Detectors tested	14-Feb-05	25 Aug 04	Yes
1.2.1.10.9	Final Calorimeter CPR Detector Tested	15-Apr-05	25 Aug 04	Yes
1.2.1.10.10	Final Calorimeter CCR Detector Tested	15-Apr-05	15-Oct-04	Yes
1.2.1.10.11	Final set of Calorimeter phototubes tested	6-May-05	6-June-04	Yes
1.2.1.10.12	End of Central Pre-shower Project	6-May-05	28-Jan-05	
1.2.3.5	End of Calorimeter Project: Level 2	6-May-05	28-Jan-05	
1.2.3.6	End of Calorimeter Project: Level 1	23-Jan-06	28-Jan-05	

IV. PROCUREMENT – P. Lukens

No significant procurements were placed during October 2004.

V. PROJECT HIGHLIGHTS

1.2 – Calorimeter

1.2.1 Central Preshower and Crack Detector – Steve Kuhlmann

Installation of the CPR upgrade continued in October. All production parts have been delivered, while some extra spare parts are being produced at ANL and MSU. Performance of the detector with cosmic rays has been good.

The table below shows the current production status of the CPR and CCR components:

Component	Produced	Total needed	Complete
Preshower tiles	2592	2592	100%
Preshower spliced fibers	2592	2592	100 %
Preshower fiber pigtails	192	192	100 %
Preshower modules	48	48	100 %
Crack tiles	480	480	100 %
Crack spliced fibers	480	480	100 %
Crack pigtails	48	48	100 %
Crack modules	48	48	100 %
Preshower & Crack clear fiber cables	192	192	100 %
Transition cards	96	96	100 %
PMT boxes	48	48	100 %

1.2.2 Electromagnetic Timing – Dave Toback

All EM Timing work has been completed.

1.3 – Data Acquisition and Trigger

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

A TDC Review was held on Sept 28 to evaluate the viability of IIa design for the remainder of Run II. The report was received in October and we are acting on the recommendations.

1.3.2 Level 2 – Ted Liu

The table below shows the current production status of the Level 2 components:

Component	Produced	Total needed	Complete
Pulsar boards	30	30	100 %
S-Link LSC/LDC cards	20	20	100 %
S-Link PCI cards	6	6 (Ops) + 6 (Spares)	50 %
S-Link fibers	30	30	100 %
AUX cards	20	20	100 %
Hotlink mezzanine cards	20	20	100 %
Taxi mezzanine cards	30	30	100 %
Hotlink/Taxi fibers	120	120	100 %
Fiber splitters	60	60	100 %
L2 decision CPUs	4	6	67 %

Much of the work during October has involved Firmware improvements and software development. Things are going well with the online systems interface and the algorithm for all trigger paths. We are ready and waiting for beam to return.

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

A review of the SLAM board was held on the 24 September in preparation for sending it out to be built (preproduction). The review committee report has been received and no major problem areas were discovered. The SLAM boards were sent out for preproduction in October as anticipated.

1.3.4 Event Builder – Bruce Knuteson

An interface to the Trigger Manager that translates ScramNet messages to Ethernet and vice versa has been completed. We have at this point tested many of the components of the new system, including the Trigger Manager interface, our Run Control interface, message passing among several SCPU's and the Event Builder Proxy, and sending data to Level 3 nodes. We have started coding a functional Level 3 builder.

1.3.6 SVT (Silicon Vertex Tracker) – Mel Shochet

AM++:

A batch of 116 standard cell chips was received and tested in the test board with zif sockets, using the same test vectors that validated the design with simulation. The yield is lower than expected but it was possible to select good chips to be soldered on the LAMB. This will allow more complete tests of the chips and the boards. Random tests are ready for the VME test stand. New prototype boards for the AM++ and LAMB are ready and submitted to the Fermilab board review.

AMS/RW:

The pulsar firmware for the sequencer is complete and tested. Hits have been successfully downloaded to the AM++ assembled with FPGAs, and roads have been read back.

Hit Buffer:

We are studying the functionality of existing Pulsar firmware (Level 2, AMS/RW, and TF) to see what can be used in the Hit Buffer. We found firmware implemented in the Level2 Isolist board that can be utilized in the Hit Buffer as well. We expect functionality implemented in other boards to also be useful.

Track Fitter:

The TF firmware was further developed, particularly aspects relating to communication and data transfer between the FPGAs. Pin assignments on the Pulsar and the mezzanine were largely completed, with the remaining pins waiting for some VME issues to be resolved. The assignments should be finished in early November, when simulation work can begin.

Mezzanine Memory Cards:

Following a minor addition to the schematic, the final art work for the large memory mezzanine card was completed. The parts for a run of 6 prototype boards were acquired, and bids came in for fabricating the boards. Construction will begin following the Fermilab board review scheduled for the first week in November.

VI. FINANCIAL STATUS (as of 31 October 2004)

The baseline cost of the Project is \$10,375K, and consists of the costs for the scope of the Run IIb Project (\$8,702K) plus the closeout costs of the silicon detector upgrade (\$1,673K), which will no longer be constructed.

CDF RunIIb Obligations Report - This report provides a summary, at Level 2, of outstanding requisitions and purchase orders where money has been committed but for which the Project has not been invoiced. This does not include requisitions in the system which have not had a Fermilab Purchase Order number assigned as of the date of the report. A brief description of the columns included in this report is given below:

- Current Month Total Cost – The cost charged to the project for the reporting month.
- Current Month Obligation – This is the total of the obligations made against the project for the reporting month.
- Year to Date Total Cost – This is the total cost charged to the project in this fiscal year.
- Year to Date Obligations with Indirect – This is the total of the obligations made against the project for this fiscal year.
- Current Purchase Orders Open Commitment – This is the total of the open commitments against the project. It includes open commitments from the current and all prior years.
- Prior Year Total Cost - This is the total cost charged to the project in all prior fiscal years.

The total project cost is simply the sum of the Year-to-Date costs and the Prior Year costs. The total committed and spent is the Total Project Cost plus the Open Commitment value.

**CDF Project Obligations Report
Through 31 October 2004**

CDF RIIB EQU - October FY05 IN \$K							
Task Number	Expenditure Category	Current Month Total Cost	Current Month Obligation	YTD Total Cost	YTD Obligations w/Indirect	Current PO Open Commitment	Prior Yr Total Cost
Silicon	M&S	0.0	0.0	0.0	0.0	103.5	539.0
	SWF	0.0	0.0	0.0	0.0	0.0	571.1
	OH	0.0	0.0	0.0	0.0	0.0	230.9
	Total 1.1	0.0	0.0	0.0	0.0	103.5	1,341.0
Calorimeter	M&S	(1.7)	0.6	(1.7)	0.6	45.8	211.8
	SWF	0.0	0.0	0.0	0.0	0.0	139.1
	OH	0.1	0.1	0.1	0.1	0.0	51.5
	Total 1.2	(1.6)	0.7	(1.6)	0.7	45.8	402.3
Trigger/DAQ	M&S	54.2	21.3	54.2	21.3	24.6	708.2
	SWF	27.8	27.8	27.8	27.8	0.0	220.7
	OH	17.1	17.1	17.1	17.1	0.0	129.2
	Total 1.3	99.2	66.2	99.2	66.2	24.6	1,058.1
Administration	M&S	0.0	0.0	0.0	0.0	0.0	29.1
	SWF	12.5	12.5	12.5	12.5	0.0	268.2
	OH	3.8	3.8	3.8	3.8	0.0	84.4
	Total 1.4	16.2	16.2	16.2	16.2	0.0	381.7
Total Project	M&S	52.6	21.9	52.6	21.9	173.9	1,488.2
	SWF	40.3	40.3	40.3	40.3	0.0	1,199.0
	OH	21.0	21.0	21.0	21.0	0.0	495.9
Grand Total		113.8	83.2	113.8	83.2	173.9	3,183.1

Total Project Cost (Inception To Date): 3,296.9

CDF Project Cost Performance Report (CPR) – This report is generated from COBRA and provides a summary of the WBS 1.2-1.4 costs of the Project down to Level 3 of the Work Breakdown Structure. The closeout for the silicon detector subproject does not have its performance tracked here. Input data originates with the status (% Complete) of the Project schedules as reported by the Level 2 managers and actual costs extracted from the Fermilab accounting system. Where possible, costs are accrued for items that have been delivered, but not yet invoiced. This is only possible for a small fraction of our cost. Financial summaries are shown for this reporting period (columns 2-6) as well as the project to date (columns 7-11). Column 12 contains our baseline BAC, and will only be changed after the formal implementation of the Change Control process. Column 13 is the projected BAC, based on the current month's schedule. A number of specialized financial terms and abbreviations used in the CPR 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. The baseline value of the BCWS 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.

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

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

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

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

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

**CDF Project
Cost Performance Report
at WBS Level 3**

Cost Performance Report - Work Breakdown Structure													
Contractor: Location:					Contract Type/No:			Project Name/No: CDF RIIb Mstr Equ - De		Report Period: 9/30/2004 10/31/2004			
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	8,701,999		0		0.00		8,701,999	0		0	0		
Funding Type-CA WBS[2] WBS[3] Item	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost Work Performed	Variance		Budgeted Cost		Actual Cost Work Performed	Variance		Budgeted	Latest Revised Estimate	Variance
	Work Scheduled	Work Performed		Schedule	Cost	Work Scheduled	Work Performed		Schedule	Cost			
EQU Equipment													
1.2 Calorimeter Upgrades													
1.2.1 Central Preshower and Crack Detectors	3,179	4,021	-1,642	842	5,663	374,675	375,045	376,964	369	-1,920	377,440	377,440	0
1.2.2 Electromagnetic timing	0	0	0	0	0	35,630	35,630	23,403	0	12,227	35,630	35,630	0
WBS[2]Totals:	3,179	4,021	-1,642	842	5,663	410,305	410,675	400,367	369	10,308	413,070	413,070	0
1.3 Run 2b DAQ and Trigger Project													
1.3.1 Run 2b TDC Project	83,584	34,122	18,066	-49,461	16,056	370,408	305,364	379,487	-65,044	-74,123	546,541	546,541	0
1.3.2 Run 2b Level 2 Project	4,928	2,391	8,511	-2,536	-6,119	263,262	356,413	313,552	93,151	42,861	437,236	437,236	0
1.3.4 Event-Builder Upgrade	23,612	4,579	0	-19,032	4,579	263,570	224,481	113,774	-39,089	110,707	518,179	518,179	0
1.3.5 Computer for Level3 PC Farm / DAQ	0	0	17,022	0	-17,022	0	85,540	209,702	85,540	-124,161	479,403	479,403	0
1.3.6 SVT upgrade	32,777	32,345	0	-432	32,345	45,569	32,345	0	-13,224	32,345	280,920	280,920	0
1.3.11 Revised XFTII Project	52,804	99,867	55,500	47,063	44,367	203,487	186,994	141,685	-16,493	45,309	1,620,128	1,620,128	0
WBS[2]Totals:	197,704	173,305	99,099	-24,399	74,206	1,146,296	1,191,136	1,158,199	44,840	32,937	3,882,406	3,882,406	0
1.4 Administration													
1.4.3 Construction Phase	23,658	24,122	16,247	464	7,875	522,316	522,780	397,971	464	124,809	958,867	958,859	-8
WBS[2]Totals:	23,658	24,122	16,247	464	7,875	522,316	522,780	397,971	464	124,809	958,867	958,859	-8
Funding Type-CA Totals:													
224,541 201,448 113,704 -23,093 87,744 2,078,917 2,124,591 1,956,537 45,674 168,054 5,254,343 5,254,336 -8													
Sub Total	224,541	201,448	113,704	-23,093	87,744	2,078,917	2,124,591	1,956,537	45,674	168,054	5,254,343	5,254,336	-8
Management Resrv.											3,447,656	3,447,664	8
Total	224,541	201,448	113,704	-23,093	87,744	2,078,917	2,124,591	1,956,537	45,674	168,054	8,701,999	8,701,999	

The table below contains current values for selected financial tracking quantities that do not appear in the standard Obligations or Cost Performance Reports. For the Silicon Detector portion of the project, we assume a BAC of \$1673K and obtain the ACWP from the Obligations report. Remaining portions of the project have their costs listed in the Cost Performance Report.

	ACWP		BCWP		BAC		Cont.	EAC	ETC	Complete
	Silicon	Nonsil.	Silicon	Nonsil.	Silicon	Nonsil.				
September	1342	1842	1342	2002	1673	5734	2967	7247	7030	45%
October	1342	1957	1342	2125	1673	5254	3448	6759	6908	50%

VII. VARIANCE ANALYSIS – P. Lukens

Subproject	Schedule Variance	Cost Variance
Calorimeter Schedule	Not Significant	Not significant
Run 2b TDC	Not Significant	Labor charges are higher than planned. This is an artifact of closing this project.
Run 2b Level 2	Ahead of schedule	Not Significant
Run 2b XFTII	Finder submission is behind by one month	Not Significant
Event Builder	An element of this related to TDC readout is behind schedule, but will be eliminated due to the change in TDC plans.	Costs are low. Some engineering has been done with physicist (no cost) labor
Computers for Level 3 and DAQ	Ahead of schedule	This is an artifact of the way Earned Value is calculated. We have purchased computers earlier than scheduled.
SVT Upgrade	None	None
Administration	None	Costs for support and travel have been below estimates.

VIII. BASELINE CHANGES

No Change Control Requests were submitted or approved during October 2004. Change control #16 was approved in November, 2004, which drops the production of the TDCs and increases engineering labor on the Level 2 trigger. The CPR shown here reflects this new baseline.

IX. FUNDING PROFILES

The funding profile is shown below:

	Funding Plan in Current Year \$K				
	FY02	FY03	FY04	FY05	Total
DOE MIE	\$ 3,460	\$ 3,509	\$ 1,673	\$ 1,732	\$ 10,375
DOE R&D	\$ 1,670	\$ 480			\$ 2,150
Foreign Contributions	\$ 39	\$ 342	\$ 252	\$ 10	\$ 643
U.S. Universities	\$ 24	\$ 225	\$ 103	\$ 26	\$ 378
Total	\$ 5,193	\$ 4,556	\$ 2,028	\$ 1,768	\$ 13,545