

1 December 2005

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 2005 Report

Attached is the monthly report summarizing the October 2005 activities and progress for the Fermilab RunIIb CDF Detector Project. This report is available electronically at:

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

cc: A. Annovi
J. Appel
E. Arroyo
D. Benjamin
J. Butler
H. Frisch
D. Hoffer
J. Huston
R. Hughes
E. James
YK Kim
D. Knapp
B. Knuteson
S. Kuhlmann
T. Liu
M. Lindgren
J. Livengood
R. Lipton
P. Lukens
T. Miao
H. Montgomery
V. O'Dell
P. Oddone
V. Pavlicek
K. Pitts
R. Roser
TJ Sarlina
T. Shaw
M. Shochet
K. Stanfield
J. Strait
E. Temple
D. Toback
C. Trimby
V. White
P. Wilson
B. Winer

RunIIb CDF Detector Project
Progress Report No. 35
1 - 31 October 2005

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 – Pat Lukens

The project continues to move towards completion. Several subprojects are now fully integrated into routine operations of the experiment. Recent operations of the experiment have taken advantage of the trigger bandwidth increases that are now possible due to the upgraded Level 2 and Event Builder systems. The remaining subprojects are entering their commissioning phases. All projects have reached the stage where production parts have been obtained or have been ordered. Integration and commissioning activities for both the track trigger projects are now progressing.

III. PROJECT MILESTONE SUMMARY (as of 31 October 2005)

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	Yes
1.3.11.5.3.8	Begin Production TDC Mezzanine Card	28-Oct-04	3-Nov-04	Yes
1.3.6.2.6.4	Begin Amp Chip Production	10-Jan-05	22-Nov-04	Yes
1.3.6.2.1.1.5	Begin AMS Mezzanine Card Production	14-Jan-05	11-Nov-04	Yes
1.3.1.17.4	TDC Readout System Complete	21-Jan-05	10-Dec-04	Yes
1.3.11.6.3.6	Receipt of TDC to Finder cables complete	18-Mar-05	11-Aug-05	Yes
1.3.5.3.7	Arrival of 15 PCs from the vendor	23-Mar-05	18-Mar-05	Yes
1.3.2.9	Pulsar Level 2 subproject ready for installation	1-Apr-05	11-Mar-05	Yes
1.3.11.8.8	Begin Joint Testing with Finder Board	14-Nov-05	14-Nov-05	
1.3.11.7.5.8	Begin Production of SLAM Boards	18-Apr-05	8-Jun-05	Yes
1.3.11.4.4.8	Begin Production TDC Fiber Transition Boards	21-Apr-05	31-May-05	Yes
1.3.11.5.3.9	Checkout of TDC Mezzanine Cards Complete	6-Jun-05	26-Jul-05	Yes
1.3.11.2.5.1	Begin Production XFT Finder Boards	8-Jun-05	31-May-05	Yes
1.3.6.1.2.5	Hit Buffer Firmware Complete for Board Test	23-Jun-05	17-Aug-05	Yes
1.3.6.1.3.5	Track Fitter Firmware Complete for Board Test	28-Jun-05	20-Apr-05	Yes
1.3.1.12.6	Installation of Modified TDC's in the COT Complete	28-Dec-05	28-Dec-05	
1.3.4.8	Finish Event-Builder Upgrade	28-July-05	22-July-05	Yes
1.3.1.12.8	TDC Modification for the COT Complete	28-Dec-05	28-Dec-05	
1.3.5.5.5	Arrival of 70 Level3 and 15 DAQ PCs	15-Aug-05	18-Mar-05	Yes
1.3.5.6.5	Arrival of 256 L3 Farm PC's from the vendor	22-Nov-05	22-Nov-05	
1.3.6.1.1.5	AMS Firmware Complete for Board Test	19-Aug-05	14-Apr-05	Yes
1.3.6.3	SVT ready for installation	27-Dec-05	27-Dec-05	
1.3.5.8	Finish Purchase of Computers for L3 DAQ system	21-Dec-05	21-Dec-05	
1.3.11.4.4.9	Checkout of TDC Transition Boards Complete	16-Sept-05	27-Oct-05	Yes
1.3.11.7.5.9	Checkout of SLAM Boards Complete	28-Sept-05	31-Oct-05	Yes
1.3.11.2.5.10	Finder Board Checkout Complete	27-Dec-05	27-Dec-05	
1.3.11.10	XFT Ready for Installation at CDF	27-Dec-05	27-Dec-05	
1.3.8	Finish Run 2b Trigger DAQ project	28-Dec-05	28-Dec-05	
1.3.9	DAQ and Trigger Upgrades Ready for Installation	17-Jan-06	28-Dec-05	
1.3.10.2	Ready for Accelerator Shutdown 2005	1-Mar-06	27-Oct-05	Yes

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

Name	Forecast	Baseline	Variance	2004				2005				2006		
				tr	tr	tr	tr	tr	tr	tr	tr	tr	tr	
Begin production of Level2 Pulsar system	11/12/03	11/12/03	0 wks	◆										
First Prototype TDC available for testing	2/16/04	11/19/03	11.35 wks	◆	★									
Arrival of the prototype Event Builder hardware	3/31/04	6/3/04	-9 wks		★	◆								
Event Builder Production Readiness Review	6/2/04	10/4/04	-17 wks		★		◆							
Begin AMS Design Work	8/2/04	9/1/04	-4.4 wks		★	◆								
Begin Track Fitter Design	8/2/04	9/1/04	-4.4 wks		★	◆								
Pulsar Hardware Ready for Installation	8/20/04	8/31/04	-1.4 wks			◆								
Arrival of the Event Builder hardware	10/15/04	10/15/04	0 wks				◆							
Begin Production TDC Mezzanine Card	11/3/04	10/28/04	0.8 wks					◆						
Begin Purchase of Pulsar Board components	11/4/04	10/20/04	2 wks					★	◆					
Begin AMS Mezzanine Card Production	11/11/04	1/14/05	-8.2 wks					★	◆					
Begin Ampchip Production	11/22/04	1/10/05	-5.8 wks					★	◆					
TDC Readout System Complete	12/10/04	6/6/05	-23.8 wks					★		◆				
Pulsar Level 2 subproject ready for installation	3/11/05	4/1/05	-3 wks						◆	★				
Arrival of 70 Level3 and 15 DAQ PCs from the vendor	3/18/05	8/15/05	-21 wks					★		◆				
Arrival of 15 PCs from the vendor	3/18/05	3/23/05	-0.6 wks						◆					
AMS Firmware Complete for Board Test	4/14/05	8/19/05	-18 wks					★		◆				
Track Fitter Firmware Complete for Board Test	4/20/05	6/28/05	-9.8 wks					★		◆				
Begin Production XFT Finder Boards	5/31/05	6/8/05	-1.4 wks							◆	★			
Begin Production TDC Fiber Transition Boards	5/31/05	4/21/05	5.2 wks							◆	★			
Begin Production of SLAM Boards	6/8/05	4/18/05	7 wks							◆	★			
Finish Event-Builder Upgrade	7/22/05	7/28/05	-0.8 wks								◆	★		
Checkout of TDC Mezzanine Cards Complete	7/26/05	6/6/05	7 wks								◆	★		
Receipt of TDC to Finder cables Complete	8/11/05	3/18/05	20.4 wks									◆	★	
Hit Buffer Firmware Complete for Board Test	8/17/05	6/23/05	7.4 wks									◆	★	
Checkout of TDC Transition Boards Complete	10/27/05	10/27/05	0 wks										◆	★
Ready for Accelerator Shutdown 2005	10/27/05	3/1/06	-16.3 wks										★	◆
Checkout of SLAM Boards Complete	10/31/05	10/31/05	0.2 wks											◆
Begin Joint Testing with Finder Board	11/14/05	11/14/05	0 wks											◆
Arrival of 256 L3 farm PCs from the vendor	11/22/05	11/22/05	0 wks											◆
Finish Purchase of Computers for Level3/DAQ system	12/21/05	12/21/05	0.2 wks											◆
Finder Board Checkout Complete	12/27/05	12/27/05	0.2 wks											◆
XFT Ready for Installation at CDF	12/27/05	12/27/05	0.2 wks											◆
SVT ready for installation	12/27/05	12/27/05	0.2 wks											◆
Installation of Modified TDC's in the COT Complete	12/28/05	12/28/05	0 wks											◆
TDC Modification for the COT Complete	12/28/05	12/28/05	0 wks											◆
Finish Run 2b Trigger DAQ project	12/28/05	12/28/05	0 wks											◆
Data Acquisition and Trigger Upgrades Ready to Install	12/28/05	1/17/06	-2.1 wks											◆

Project: CDF RunIIb DAQ
 Status Date: 10/31/05
 Print Date: 11/21/05

Completed Milestone ★
 Current Forecast ◇

Baseline Milestone ◆

IV. PROCUREMENT – Pat Lukens

No significant procurements were placed in October, 2005.

V. PROJECT HIGHLIGHTS

1.3 – Data Acquisition and Trigger

1.3.1 TDC (Time to Digital Converter) – Eric James

The process of modifying, testing and installing TDCs was delayed by several weeks due to a significantly increased failure rate following modification. The high failure rate was traced to problems with PAL programming. We identified a more modern PAL programmer at Fermilab that will be used to program chips for the remainder of the boards. The process of fixing the bad boards with PALs from the older programmer is underway, and we expect to catch up in about one month. Modified boards have been installed in 15 out of 20 crates. Thirteen boards were modified by the techs during October. Progress was made on understanding issues with test equipment at the University of Michigan, but no new spares were received from Michigan in October. The lack of available spares will force us to continue with board replacements on the detector at a rate of ten boards per access opportunity.

Month	Board Modification		Detector Installation	
	Complete	Remaining	Complete	Remaining
January	39 (13%)	261	0	204
February	61 (20%)	239	21 (10%)	183
March	98 (33%)	202	42 (21%)	162
April	116 (39%)	184	69 (34%)	135
May	126 (42%)	174	69 (34%)	135
June	150 (50%)	150	99 (48%)	105
July	156 (52%)	144	99 (49%)	105
August	176 (59%)	124	132 (65%)	72
September	199 (66%)	101	151 (74%)	53
October	212 (71%)	88	161(79%)	43

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

Stereo Linker Association Module (SLAM) Boards: All production SLAM boards were delivered by the third week of October. Check out of the boards began at OSU. By the end of October, 15 of the 31 SLAM boards had passed the checkout. Firmware development continued with a focus of the Pass-Through Design which models the current XFT LOM boards. This design was tested with production SLAM boards in the CDF DAQ system. These tests were successful. Firmware development of the Level 1 pipeline and Level 2 Buffers also continued.

XTC and TDC Transition Module: By the end of October, more than 75% of the detector was instrumented with XTC boards. Diagnosis work continued on low level "lock up" problems seen with the XTC boards on the detector. Check out of the TDC transition modules was completed in mid-October. The boards were shipped to Fermilab and are ready for installation. Work continues on capturing data via the XTC->TDC TM->Fiber Optic->Finder path.

Cabling: Full production of fibers for patch panel to finder, Finder to SLAM, and Finder to L2 fibers were received. Testing of the TDC to patch panel fibers prior to installation

revealed broken connections at the connector. Repeated testing with cycles of connection and disconnection between indicate that these failures continue with repeated use. The failure rate in each of these testing cycles is in the 1-3% range. The problem appears to be caused by the tight construction of the fibers and the design of the LC type connectors. Two options are being considered to solve this problem: re-terminate the fibers with a different connector design or completely replace the assemblies. A decision on which option to pursue will be made in November.

Stereo Finder: Finder firmware development continued including implementation of the L2 output format and details of L1 pipeline and L2 buffering. Finder printed circuit board fabrication was completed and assembly started. The assembled TX and RX mezzanine cards were delivered and final preparation work (installation of optical components and CPLD programming) was started. Teststand software development continued for integrated XTC to Finder and Finder to SLAM tests.

1.3.5 Level 3 computers upgrade – Doug Benjamin

All purchases for Level 3 and DAQ computers were made in September and early October. We're awaiting the arrival of the hardware. Work continues in the CDF assembly building to ensure that the computer racks will fit and be powered when the computer nodes arrive. The computer racks arrived during October. The computers arrived in November. Due to the fact that racks will have liquid cooling, additional door were ordered. The installation of the node will occur after the doors arrive in December.

An MIT postdoc is working on the port of the Level 3 code infrastructure to Scientific Linux, the intended Level 3 operating system coming out of the Mar '06 shutdown.

1.3.6 SVT (Silicon Vertex Tracker) – Alberto Annovi

AM++ and AMS/RW: The AM++ boards and LAMBs production for the 512k patterns is in progress. About 90% of the LAMBs tested good, the remaining 10% are currently under further tests. About 60% AM++ boards tested good and ready.

Hit Buffer: Bugs in firmware performance tracked to instabilities in timing of signals to Mezzanine cards. Topologically fixing the placement of the input and output registers in the chip design fixed this problems. Ported entire HB++ design to compile under Quartus II 4.2 only (as opposed to LeonardoSpectrum + Quartus II 2.2) for greater flexibility with fitting constraints. Firmware compiled and meets timing at >70 MHz (effective data processing speed = 35 MHz). Firmware debugged in test stand and prepared for integration in vertical slice.

Track Fitter: Work on the Track Fitter is complete.

VI. FINANCIAL STATUS (as of 31 October 2005)

The baseline cost of the Project is \$8,196K, consisting of Run IIb Project costs (\$6,855K) plus closeout costs of the silicon detector upgrade (\$1,341K), which will no longer be constructed.

Current Financial Tracking Report - The table below contains current values for financial tracking quantities that do not appear in the standard Obligations or Cost Performance Reports.

	ACWP		BCWP		BAC		Cont.	EAC	ETC	Complete
	Silicon	Non-Sil	Silicon	Non-Sil	Silicon	Non-Sil				
CY 2004										
October	1342	1957	1342	2125	1673	5254	3448	6759	6908	50%
November	1357	2081	1357	2366	1673	5254	3448	6642	6652	54%
December	1341	2199	1341	2673	1673	5254	3448	6453	6361	58%
CY 2005										
January	1341	2277	1341	2909	1673	5254	3448	6295	6125	61%
February	1341	2396	1341	3095	1341	5531	3503	6173	5939	65%
March	1341	2866	1341	3361	1341	5531	3503	6377	5673	68%
April	1341	3028	1341	3378	1341	5945	3089	6936	5656	65%
May	1341	3274	1341	3850	1341	5945	3089	6710	5184	71%
June	1341	3715	1341	4378	1341	5945	910	6623	2477	78%
July	1341	4143	1341	4677	1341	6075	780	6882	2178	81%
August	1341	4291	1341	4885	1341	6075	780	6822	1970	84%
September	1341	4385	1341	5012	1341	6075	780	6789	1843	86%
October	1341	4510	1341	4942	1341	5846	1009	6755	1913	87%
November										
December										

CDF RunIIb Obligations Report - This report provides a Level 2 summary of outstanding Purchase Orders where funds have been committed but for which the Project hasn't been invoiced. This does not include requisitions in the system where a Fermilab PO number has not yet been assigned. Brief descriptions of the columns in this report are 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 – The total of the open commitments against the project. It includes open commitments from the current and all prior years.
- Prior Year Total Cost - 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 2005**

CDF RIIb EQU - October FY06 IN \$K								
Task Number	Expenditure Category		Current Month Total Cost	Current Month Obligation	YTD Total Cost	YTD Obligations w/Indirect	Current PO Open Comm	Prior Yr Total Cost
Silicon	M&S		0.0	0.0	0.0	0.0	0.0	538.8
	SWF		0.0	0.0	0.0	0.0	0.0	570.0
	OH		0.0	0.0	0.0	0.0	0.0	228.2
	Total 1.1		0.0	0.0	0.0	0.0	0.0	1,336.9
Calorimeter	M&S		0.0	0.0	0.0	0.0	1.6	275.0
	SWF		0.0	0.0	0.0	0.0	0.0	139.1
	OH		0.0	0.0	0.0	0.0	0.0	52.6
	Total 1.2		0.0	0.0	0.0	0.0	1.6	466.7
Trigger/DAQ	M&S		72.9	2.5	72.9	2.5	728.6	2,315.0
	SWF		18.4	18.4	18.4	18.4	0.0	641.8
	OH		17.9	0.0	17.9	17.9	0.0	377.3
	Total 1.3		109.1	21.0	109.1	38.8	728.6	3,334.1
Administration	M&S		0.0	0.0	0.0	0.0	0.0	42.2
	SWF		12.3	12.3	12.3	12.3	0.0	412.6
	OH		3.8	0.0	3.8	3.8	0.0	129.2
	Total 1.4		16.1	12.3	16.1	16.1	0.0	584.0
Total Project	M&S		72.9	2.5	72.9	2.5	730.2	3,170.9
	SWF		30.7	30.7	30.7	30.7	0.0	1,763.5
	OH		21.7	0.0	21.7	21.7	0.0	787.3
Grand Total			125.2	33.2	125.2	54.9	730.2	5,721.7

Total Project Cost (Inception To Date): 5,846.8

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. Silicon detector subproject closeout costs are not 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
as of 31 October 2005**

Cost Performance Report - Work Breakdown Structure													
Contractor:					Contract Type/No:			Project Name/No:		Report Period:			
Location:								CDF RIIb Mstr Equ -		9/30/2005		10/31/2005	
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	6,855,000		0		0.00		6,855,000	0		0	0		
Funding Type-CA	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost Work	Variance		Budgeted Cost		Actual Cost Work	Variance		Baseline BAC	Latest Revised BAC	BAC Delta
	Work Scheduled	Work Performed		Schedule	Cost	Work Scheduled	Work Performed		Schedule	Cost			
Item	Scheduled	Performed	Performed	Schedule	Cost	Scheduled	Performed	Performed	Schedule	Cost	BAC	BAC	Delta
EQU Equipment													
1.2 Calorimeter Upgrades													
1.2.1 Central Preshower and Crack Detectors	0	0	19,997	0	-19,997	444,504	444,504	442,925	0	1,579	444,504	444,504	0
1.2.2 Electromagnetic timing	0	0	0	0	0	23,403	23,403	23,403	0	1	23,403	23,403	0
WBS[2]Totals:	0	0	19,997	0	-19,997	467,908	467,908	466,328	0	1,580	467,908	467,908	0
1.3 Run 2b DAQ and Trigger Project													
1.3.1 Run 2b TDC Project													
1.3.1 Run 2b TDC Project	20,540	89,325	-35,131	68,785	124,456	599,677	582,650	480,757	-17,027	101,893	651,795	651,795	0
1.3.2 Run 2b Level 2 Project													
1.3.2 Run 2b Level 2 Project	0	76,223	83,378	76,223	-7,155	473,959	473,959	470,193	0	3,765	473,959	473,959	0
1.3.4 Event-Builder Upgrade													
1.3.4 Event-Builder Upgrade	0	53,173	199,064	53,173	-145,890	425,336	415,310	407,495	-10,027	7,814	435,624	435,624	0
1.3.5 Computer for Level3 PC Farm / DAQ													
1.3.5 Computer for Level3 PC Farm / DAQ	509,916	355,198	132,389	-154,718	222,809	940,428	533,799	369,433	-406,629	164,366	1,080,075	1,080,075	0
1.3.6 SVT upgrade													
1.3.6 SVT upgrade	10,221	91,593	116,168	81,371	-24,575	342,683	343,717	312,136	1,034	31,581	362,639	362,639	0
1.3.11 Revised XFTII Project													
1.3.11 Revised XFTII Project	103,783	856,433	859,252	752,651	-2,819	1,567,813	1,509,335	1,403,788	-58,478	105,547	1,629,697	1,629,697	0
WBS[2]Totals:	644,460	1,521,946	1,355,120	877,486	166,826	4,349,896	3,858,769	3,443,803	-491,127	414,967	4,633,789	4,633,789	0
1.4 Administration													
1.4.3 Construction Phase													
1.4.3 Construction Phase	17,819	102,533	106,472	84,714	-3,939	615,742	615,742	600,027	0	15,715	744,322	744,322	0
WBS[2]Totals:	17,819	102,533	106,472	84,714	-3,939	615,742	615,742	600,027	0	15,715	744,322	744,322	0
Funding Type-CATotals:	662,279	1,624,479	1,481,589	962,200	142,890	5,433,546	4,942,419	4,510,158	-491,127	432,262	5,846,019	5,846,019	0
Sub Total	662,279	1,624,479	1,481,589	962,200	142,890	5,433,546	4,942,419	4,510,158	-491,127	432,262	5,846,019	5,846,019	0
Management Reserve											1,008,981	1,008,981	0
Total	662,279	1,624,479	1,481,589	962,200	142,890	5,433,546	4,942,419	4,510,158	-491,127	432,262	6,855,000	6,855,000	0

VII. VARIANCE ANALYSIS – D. Benjamin

Subproject	Schedule Variance	Cost Variance
Run 2b TDC	Not significant.	Some overestimate of the engineering needs produced a positive cost variance
Run 2b Level 2	None	None
Run 2b XFTII	None	Some overestimate of the engineering needs produced a positive cost variance
Event Builder	Complete	Complete
Computers for Level 3 and DAQ	All computer purchases were placed in September and early October. This schedule variance will be reduced when the delivery is recorded.	Most purchases have been at a lower price than our early estimates.
SVT Upgrade	None	None

VIII. BASELINE CHANGES

None were made during the month of October. However, Change Request #24 was submitted prior to the completion of this report, and the Cost Performance Report shown here reflects that change. This change readjusted some of the costs, based on improved knowledge and some schedule slippage. \$229K was returned to contingency with this change.

IX. FUNDING PROFILES

The funding profile for the RunIIb CDF Detector Project is shown below.

	Funding Plan in Current Year \$K				
	FY02	FY03	FY04	FY05	Total
DOE MIE	\$ 3,460	\$ 3,509	\$ 1,227	\$ -	\$ 8,196
DOE R&D	\$ 1,670	\$ 480	\$ -	\$ -	\$ 2,150
Foreign Contributions	\$ 39	\$ 518	\$ 234	\$ 404	\$ 1,195
U.S. Universities	\$ 24	\$ 225	\$ 103	\$ 26	\$ 378
Total	\$ 5,193	\$ 4,732	\$ 1,564	\$ 430	\$ 11,918