

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Master Schedule and Overview
WBS: All
Date Submitted: 11/27/00
Submitted By: Harry Weerts, Bill Freeman

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M1-Solenoid Delivered to Fermilab	5/12/97	5/12/97	0 w
X	M2-Central Preshower Module Fabrication Complete	12/16/97	12/16/97	0 w
X	M2-Central Preshower Installed on Solenoid	5/21/98	5/21/98	0 w
X	M1-Solenoid Installed and Tested	9/30/98	9/30/98	0 w
X	M3-Level Ø-South Installed	5/8/00	2/9/00	12.6 w
X	M2-Muon End Toroids Installed on Platform	8/4/00	11/15/00	-14.2 w
X	M1-Begin Shield Wall Removal/Ready to Roll-in	11/7/00	11/22/00	-2.2 w
	M1-Detector Rolled-in and Hooked Up	2/22/01	2/2/01	2.8 w

Note: The full set of reportable milestones are collected and sorted by date at the end of this report. Also, a separate monthly report for the solenoid project will no longer be included, since that project is now formally complete. The reportable milestones associated with the solenoid project are now included in the above list.

Areas of Concern

Technical

The trigger Level 2 Alpha boards received from the vendor do not function properly. Two testing efforts, one at Univ. Illinois at Chicago and one at Fermilab, have been established to address this problem. In general, delivery of electronics for the trigger and the front-end systems are a concern.

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

- Central silicon ladder and wedge production has been completed. The south half of the silicon detector (SMT-S) has been assembled and is ready for installation in DØ. We have read out a number of channels corresponding to 10% of the complete silicon system, and data integrity and noise levels are as expected.
- Considerable effort is going into creating the infrastructure for the silicon detector at DØ (interlocks, cooling system, gas system, cabling, etc.)
- In the forward muon system, the C-layer trigger pixel and tracking chamber layers were installed on the huge EMC trusses that support them.
- Overall installation of detectors at DØ is progressing well.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Silicon Tracker
WBS: 1.1.1
Date Submitted: 11/22/00
Submitted By: Marcel Demarteau, Ron Lipton

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	H Half-Wedge Fabrication 20% Complete	10/15/99	10/15/99	0 w
X	3 Chip Ladder Fabrication 80% Complete	10/26/99	10/20/99	0.6 w
X	9 Chip Ladder Fabrication 20% Complete	11/4/99	11/3/99	0.2 w
X	F Wedge Assemblies 20% Complete	1/24/00	1/19/00	0.4 w
X	6 Chip Ladder Fabrication 20% Complete	1/31/00	1/3/00	3.9 w
X	H Half-Wedge Fabrication 80% Complete	3/29/00	2/23/00	5 w
X	6 Chip Ladder Fabrication 80% Complete	7/12/00	3/14/00	16.8 w
X	Low Mass Cables Available For Silicon South	7/17/00	NA	0 w
X	9 Chip Ladder Fabrication 80% Complete	7/31/00	3/27/00	17.4 w
X	F Wedge Assemblies 80% Complete	7/31/00	4/26/00	13.2 w
X	Low Mass Cables Available for Silicon North	9/4/00	NA	0 w
X	M2-First Silicon Tracker Barrel/Disk Module Complete	9/14/00	1/24/00	33 w
X	South H-Disks Ready to Move to DAB	10/13/00	7/3/00	14.4 w
X	South Half-Cylinder Complete and Ready to Move to DAB	10/25/00	8/1/00	12.2 w
	M3-All Silicon Tracker Barrels/Disks Complete	11/20/00	8/25/00	12.2 w
	North Half-Cylinder Complete and Ready to Move to DAB	12/12/00	9/18/00	12 w
	M1-Central Silicon Complete	12/12/00	9/18/00	12 w
	M2-Silicon Tracker Installed in Solenoid/Fiber Tracker	1/4/01	9/25/00	13.6 w

Areas of Concern

Technical

Many of the issues related to reading out a large system have been addressed at the 10% test. There are continuing studies to understand the proper reset modes for the electronics and proper operation in the colliding beams environment. Large pedestal jumps are occasionally seen in some modes. Changes were implemented on the adapter cards to insure that improper initialization of the SVX chip does not damage interface card electronics.

Schedule

Delivery of electronics is likely to be the determining factor in the final hook-up and test of the SMT at DØ. Modules and assemblies will be on schedule.

Resources

None

Cost

There is some modest additional cost exposure in the bias voltage system and the interface card production and testing.

Change Requests

None

Progress Summary

- Assembly and test of all ladder types was completed in October. F-wedge assembly also was completed. There remain ~15 H half-wedges to build and test.
- Assembly of five out of six barrel modules is complete, with the sixth barrel to be completed in early November.
- Eleven of twelve F-disks are complete.
- Three of four H-disks are complete.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

- Assembly of the south half of the silicon (SMT-S) was completed and cabling was begun in early October. Cabling was completed in two weeks. All 360 ladder and wedge electronic chains in SMT-S read out properly. Final prep work on the half cylinder is complete and the SMT-S is ready for transport to DØ. Several dry runs are being planned and mock-ups have been prepared.
- The 10% test was run with a production barrel/disk module. This system consists of ~80,000 channels of readout with final or near-final versions of the hardware and software. Checks were made for data integrity and noise performance and cosmic ray data was recorded. The bit error rate is less than 1 in 10^{14} and system coherent noise is less than 0.5 counts.
- All of the final low-mass cables were produced by the end of October. Some H-disk cables still need to have surface mount components added and final QC checks performed.
- Installation and checkout of the water, air, and interlock systems is continuing, and these systems should be available when the SMT is turned on.
- The first lot of fifteen interface cards was released for production. The delivery and testing of these cards are likely to determine the rate at which the detector can be commissioned.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Fiber Tracker and VLPCs
WBS: 1.1.2
Date Submitted: 11/27/00
Submitted By: Alan D. Bross

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
	<i>Detector</i>			
X	M2 - Assembly Design Complete	3/5/99	3/5/99	0 w
X	M2-First Cylinder Complete	9/2/99	9/2/99	0 w
X	M3-Fiber Tracker Ribbon Fabrication 50% Complete	11/5/99	11/12/99	-0.9 w
X	M2-Fiber Tracker Assembly Begun	2/1/00	12/6/99	6.2 w
X	M3-Fiber Tracker Cylinders 8, 7, 6, and 5 Complete	3/2/00	1/28/00	5 w
X	M3-Fiber Tracker Ribbon Fabrication Complete	5/10/00	3/6/00	9.5 w
X	M3-Fiber Tracker Ribbon Mounting Complete	5/13/00	4/20/00	3.3 w
X	M2-Fiber Tracker Assembly Complete	5/26/00	5/4/00	3.3 w
X	Waveguide Production 50% Complete	7/24/00	1/29/00	24.6 w
X	M3-Waveguide Production Complete	11/7/00	6/5/00	22 w
	<i>VLPCs</i>			
X	M2-VLPC Production 50% Complete	8/31/97	8/31/97	0 w
X	M3-VLPC Cryo System Operational	8/18/00	6/12/00	9.6 w
X	M3-VLPC Cassette Assembly 50% Complete	9/13/00	4/12/00	21.5 w
	M3-VLPC Cassette Assembly Complete	2/12/01	8/22/00	23.4 w

Areas of Concern

Technical

None

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

- Approximately 64 cassettes fabricated; production continues.
- Axial waveguide installation is complete.
- Waveguide fabrication is complete (except for re-makes as necessary following testing after installation).

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Forward Preshower
WBS: 1.1.4
Date Submitted: 11/17/00
Submitted By: Abid Patwa

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M2-Forward Preshower Module Fabrication Begun	11/4/98	11/4/98	0 w
X	M3-1st Forward Preshower Detector Complete	2/24/00	1/12/00	6.2 w
X	Module Fabrication and Testing Complete	4/1/00	12/10/99	14 w
X	M3-2nd Forward Preshower Detector Complete	4/3/00	3/8/00	3.6 w

Areas of Concern

Technical

None

Schedule

Although waveguide production for the FPS continues, completion of all required cables awaits delivery of an additional supply of clear fibers, expected in early January 2001. This effect causes the installation of all FPS waveguides on the cryostat heads to begin later than anticipated. However, in order to minimize the installation period, many of the necessary issues including the welding of proper strain-relieving about the EC are currently being addressed.

Resources

None

Cost

None

Change Requests

None

Progress Summary

- Waveguide production continued at Notre Dame and Indiana University, with approximately 80% of the cables that will occupy the FPS shower layers 1 and 2 completed. The remaining forward MIP-detecting layers (3 and 4) require the additional supply of fiber mentioned above. The order to the vendor has been placed.
- In order to avoid any interference with existing CFT/CPS cables on the central cryostat wall during detector operation, a modification of the FPS waveguide routing plan on the EC head was made. This does not cause any alteration in waveguide production.
- The FPS cable winder needed to support waveguides and allow for their articulation was removed from the EC-CC intercryostat gap, being replaced by an improved approach that minimizes the stress on delicate individual fibers.
- The full delivery of twisted-pair ribbon cables controlling the LEDs located within the FPS was received. Installation of custom electrical connectors on each cable has begun and should be completed by early December.
- Technical issues for routing the electrical LED pulser cables about the EC head and through the calorimeter's cable winder are currently being discussed, with installation anticipated in December 2000.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Tracking Electronics
WBS: 1.1.5
Date Submitted: 11/22/00
Submitted By: Marvin Johnson, Fred Borcharding

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	First Readout Crate Installed & Working	11/16/99	12/2/99	-2 w
X	10 Digital Boards Available	7/28/00	3/22/00	18 w
X	Ten 8-chip Analog Boards Available	8/8/00	4/19/00	15.4 w
	Multichip Modules Received	1/30/01	2/23/00	47 w
	Mixer Boards Ready	1/31/01	6/22/00	30.2 w

Areas of Concern

Technical

The noise level of the analog front-end boards is still too high. However, we are making progress on the problem. The concern is that resolving this issue may have a schedule impact.

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

FiberTracker

- The multi-chip modules may arrive before the end of this year, somewhat earlier than the current schedule milestone.
- The mixer boards are on schedule.
- The analog front-end boards are functional except for two noise problems and a small amount of firmware programming. These boards were scheduled for manufacture starting December 1. It is now likely that this will be delayed at least two weeks for further noise testing. If the delay is only two weeks or so it will have little impact on the schedule since all parts are available for manufacture and the vendor can complete the boards within about two weeks of release.
- The digital motherboards are here and are fully populated with parts. The large daughter boards are also here and are being loaded by PREP. The small daughter boards should arrive by the end of November.
- Progress on the firmware for the trigger modules is good.
- Much work is occurring on infrastructure items such as crates, power supplies etc. The moveable counting house work is nearly complete, and we expect the south half of the detector platform to be nearly complete by the end of November.

SiliconTracker

- The sequencer testing and repair are going well. There are less than 40 (out of 150) that need to be tested. There are an additional 12 or so that need to be repaired.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

- The revisions to the sequencer controller are complete, and loaded boards should be available by the end of November or early December.
- Interface cards are in production and the first fifteen are here. The order should be completed in December.
- Two of the power supplies for the interface boards should be available in November (1/4 of the total) but the rest will not arrive until January. We will use temporary supplies until then.
- Cable installation should start in November and be completed in early December.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Calorimeter Electronics
WBS: 1.2.1
Date Submitted: 11/18/00
Submitted By: Mike Tuts

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	SCA Testing Complete	11/23/99	12/15/99	-2.8 w
X	Shaper Hybrid 50% Complete	2/22/00	5/9/00	-11.05 w
X	M2-Calorimeter Preamp System Test Complete	7/13/00	3/31/00	14.4 w
	Daughterboard Vendor Production Complete	12/13/00	6/16/00	24.8 w
	Timing System Installed	12/13/00	8/18/00	16 w
	M3-Calorimeter CC,ECN Preamp Installation Complete	12/19/00	3/31/00	36.4 w
	BLS Motherboard Assembly Complete	1/29/01	8/7/00	23.6 w
	M2-Calorimeter BLS Assembly Complete	2/5/01	9/26/00	17.6 w

Areas of Concern

Technical

The testing of the second batch of BLS motherboards revealed an excessive number with broken internal traces. This problem is being discussed with the vendor.

Schedule

We have incurred delays in the installation of preamps and preamp power supplies because of (a) limited manpower, and (b) limited access to the preamp platform area. As access to these areas becomes more difficult with the installation and commissioning of other detectors, we may incur additional delays.

Resources

- While we have sufficient total manpower, it consists of a few people working overtime. This has led to a quality control problem observed in the BLS power supply assembly. We would prefer, and will request, to have a dedicated technician available during working hours when better supervision is available.
- We are concerned that we do not have sufficient manpower to test the BLS daughtercards and motherboards at Stony Brook. We are attempting to get shifters to help; we have promises of help, but as yet have not realized it.

Cost

None

Change Requests

None

Progress Summary

- 1800 (of 5000) BLS daughtercards are assembled.
- 479 (of 1250) BLS motherboards are assembled.
- All pulser power supplies have been assembled.
- 6 (of 36) BLS power supplies have been assembled and passed tests.
- The HV modules have been tested.
- The HV control software is functioning.
- All HV cables have been tested, repaired, and recabled except at the calorimeter end.
- The Central Calorimeter has been filled.
- The temperature monitoring readout prototype has been installed and tested.
- A full chain of electronics was read out.
- The HV for the monitoring is under test.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Intercryostat Detector
WBS: 1.2.2
Date Submitted: 11/27/00
Submitted By: Andy White, Lee Sawyer

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M3-ICD Tile Modules/Boxes Ready	4/19/00	1/18/00	13.2 w
X	M2-ICD Modules Arrive at Fermilab	4/24/00	1/25/00	12.8 w
X	M3-InterCryostat Detectors Installed	5/5/00	2/1/00	13.6 w
	Drawers Ready	12/20/00	12/14/99	50.2 w

Areas of Concern

Technical

- A scheme for fiber cable routing on the ECs is still needed.
- MIP calibration of ICD tiles will require individually dismounting each box and cosmic-ray testing it. This will require close interaction with the FPS.

Schedule

- The second pair of crates will be delivered to Fermilab in early December.
- The second test stand, for ICD module commissioning, will be assembled at Fermilab in December.

Resources

- A limited amount of Fermilab technical support will be needed to install the second two crate/block/backplane assemblies under the cryostats.
- Welder/technician support will be needed to install links for the fiber cables on the faces of the ECs.
- Some technical support will be needed to mount two temporary trigger scintillator counters in the north intercryostat region in early December for ICD cosmic-ray running.

Cost

None

Change Requests

We will be requesting an extension of the end date of our present MOUs (UTA and La Tech) through June 30, 2001.

Progress Summary

- The second two crate/backplane assemblies were assembled and tested at UTA.
- The missing H.V. filter resistors on the motherboard are being fitted.
- The H.V. fanout boxes have been assembled and installed in the moveable counting house. Some additional work is required to allow H.V. adjustment on channel 1 for each group of three channels.
- 70% of the short SHV cables have been made at UTA.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Muon Central
WBS: 1.3.2
Date Submitted: 11/17/00
Submitted By: Tom Diehl

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
	CFA Commissioning Complete	2/15/01	7/10/00	30.3 w
	PDT Commissioning Complete	2/20/01	6/9/00	34.8 w

Areas of Concern

Technical

None

Schedule

- The completion of the gas system for the PDTs drives the end date for commissioning. We have ordered all the components for the gas room except for the gas recycling and cleaning system, which is still under design. The number of PDTs we are operating on bottled gas has increased from 3 to 6.
- The recycler/cleaner for the PDT gas system must be complete before we can turn on the HV and record hits from collisions.
- A- ϕ system commissioning is still on hold because of a lack of physicists.

Resources

During October there were only 3.0 FTE physicists commissioning the three systems that make up the central muon detector. This is up from 2.6 the month before. I am optimistic that the manpower working on commissioning will increase again next month.

Cost

None

Change Requests

None

Progress Summary

Considerable effort continues to be dedicated to finishing the infrastructure, such as cabling and electronics.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Muon Forward Trigger Detectors
WBS: 1.3.3
Date Submitted: 11/22/00
Submitted By: Dmitri Denisov

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M2-Muon Forward Trigger Counter Assembly 10% Complete	10/12/98	10/12/98	0 w
X	All Pixel Octants Assembled	2/23/00	4/4/00	-5.8 w
	All Muon Forward Trigger Detector Planes Installed	1/15/01	8/25/00	18.8 w

Areas of Concern

Technical

None

Schedule

B-layer plane installation is on the critical path for the DØ roll in. Our efforts have been concentrated on finishing design and procuring parts to start installation as soon possible.

Resources

- The lack of availability of a survey crew slowed down installation operations in some cases.
- As the end of installation nears the March 1 date for being rolled-in, the availability of personnel for commissioning of the detectors and electronics on a short time scale becomes critical.

Cost

None

Change Requests

None

Progress Summary

- Design of all major mechanical support structures was finished. Orders were placed with delivery dates in late November or early December.
- C-layer planes were assembled and mounted on the EMC trusses.
- Cabling of A-layer North plane was finished (first fully cabled plane) and the cabling of C-layer planes was started.
- Four North A-layer octants were readout into the DØ DAQ system and the data was analyzed using on-line monitoring software. Cosmic ray spectra were within expectations.
- Installation of calibration system electronics and cables is 90% done.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Muon Forward Tracker
WBS: 1.3.4
Date Submitted: 11/22/00
Submitted By: Dmitri Denisov

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M2-Muon Forward Tracker MDT Assembly 10% Complete	1/29/99	1/29/99	0 w
X	Arrival Of C-Layer MDT Modules At FNAL	11/3/99	10/22/99	1.7 w
X	M2-All Muon Forward Tracker MDT Modules At Fermilab	3/30/00	3/10/00	2.8 w
X	B-Layer Octants Assembled	8/24/00	4/18/00	18 w
X	All MDT Octants Assembled	8/24/00	7/14/00	5.8 w
	Muon Forward Tracker B-Layer Planes Installed	12/21/00	6/15/00	26.2 w
	All MDT Planes Installed	12/21/00	8/4/00	19.2 w

Areas of Concern

Technical

None

Schedule

Installation of B-layer octants is on the critical path for the DØ roll in. Since the trigger detector planes can be installed only after MDT planes are installed, cabled, and surveyed, B-layer MDT installation is critical for finishing the DØ muon system installation.

Resources

- Availability of a survey crew is essential for MDT octant installation.
- Since the time left for commissioning of MDT octants with final electronics is getting very short, availability of personnel for commissioning is critical.

Cost

None

Change Requests

None

Progress Summary

- Design of all the hardware for MDT octant installation is finished, and orders have been placed with delivery dates in mid-November.
- All sixteen C-layer MDT octants have been installed on the EMC trusses, connected to the gas system, and cabled.
- Cabling of North A-layer octants was finished. These octants have been connected to a temporary gas system and tested with cosmic rays using the DØ DAQ. Cosmic-ray spectra are consistent with expectations.
- MDT front-end electronics production and installation were finished.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Muon Electronics
WBS: 1.3.5
Date Submitted: 11/22/00
Submitted By: Bill Freeman

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	MDT ADB Fabrication Complete	12/2/99	12/2/99	0 w
X	MDC Fabrication Complete	1/31/00	12/13/99	5 w
X	M2-Muon Electronics Preproduction Installation Complete	1/31/00	12/13/99	5 w
X	FEB, CB Production Complete	4/10/00	1/3/00	14 w
X	SFE, SRC Fabrication Complete	9/21/00	2/3/00	32.5 w
X	MRC, MFC Production Complete	10/18/00	3/27/00	28.8 w

Areas of Concern

Technical

None

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

The muon electronics project is complete.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Trigger
WBS: 1.4.1-1.4.5
Date Submitted: 11/20/00
Submitted By: Gerald C. Blazey

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	SLICs Received	12/10/99	11/10/99	4 w
X	M3-Establish Single Crate Internal Data Movement	2/17/00	1/6/00	6 w
X	Preproduction MTCxx, MTFB, and MTCM Complete	10/19/00	1/24/00	38 w
X	M3-Muon Level 1 Trigger Preproduction Testing Complete	11/8/00	4/18/00	28.6 w
	MBTs Received	11/30/00	3/16/00	36 w
	M3- Cal Readout Available to L2	12/13/00	2/11/00	42.6 w
	M3-L3 Operational (One Full Chain)	1/2/01	6/1/00	29 w
	Production MTCxx, MTFB, and MTCM Complete	2/2/01	6/27/00	30 w
	Global Installation Complete	3/2/01	7/12/00	32 w
	L2 Cal Installation Complete	3/2/01	8/21/00	26.4 w
	Alpha Cards Received	3/30/01	5/15/00	44 w
	L2 Muon Installation Complete	4/27/01	7/26/00	38 w
	L2 CTT Installation Complete	4/27/01	8/9/00	36 w
	M3-Trigger Level 2 Commissioned	6/4/01	9/21/00	35 w

Areas of Concern

Technical

Teams from the University of Illinois-Chicago and the Fermilab Computing Division started examining and repairing the Level 2 Alpha production. Alternatives for production of Level 2 processors are being evaluated.

Schedule

The late delivery of Alpha cards has pushed commissioning of the full Level 2 system into spring 2000. However, because of the uncertain status of the Alpha repair, the exact date remains somewhat uncertain. Layout difficulties continue to delay the delivery of Level 3 hardware components.

Resources

None

Cost

None

Change Requests

None

Progress Summary

Framework

Integration of the front-ends into the framework and commissioning of the system was completed.

Luminosity Monitor

The luminosity monitor TDC board layout was completed. Signal, H.V., and power supply cabling procurement and design also continued.

Level 1

Production and testing of Level 1 muon cards continued. Work focused on the MTC10 MTFB. Design of the MCCM card work was nearly completed, and testing of the MCEN preproduction card continued. Progress also was made

DØ Upgrade Monthly Progress Report

for the month of October, 2000

integrating the Level 1 muon into the DAQ system and on the simulation. Testing continued on the first pre-production Level 1 CTT/CPS AFE8 (analog front-end) boards. AFE8 production remained on schedule. Work on the AFE12 layout continued. Production of the MCMs (multi-chip modules) reached fifty items per day. The layout of the mixer box boards was begun, and the layout of the mixer backplanes is being reviewed. The DFE (digital front-end) daughter board delivery has been delayed. The bare board double-wide daughters have been delivered and their components are on-site. Significant progress on the VHDL coding of the DFE, collectors, and broadcasters was made. Crate installation has begun.

Level 2

Debugging of the Level 2 Alphas commenced at both UIC and the CD. Additional Alphas were received from the vendor, ADCO, on October 16th, and these also were of poor quality. Final production of the MBTs began. Prototyping of CIC/SFO continued, as did evaluation of the FICs at SACLAY. Significant progress was made on online operating software, trigger algorithms, and simulation. Cable and rack installation continued.

Level 3

The DAB Level 3/DAQ system supported commissioning. Design of the hardware system required modification due to unavailability of parts and timing simulations. The Level 3/Filtering group evaluated their schedule, continued efforts on the development of Level 3 tools and filters, and presented an open tutorial on the software on October 26th.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Subsystem: Online
WBS: 1.5.1
Date Submitted: 11/22/00
Submitted By: Stuart Fuess

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	Steady DAQ Running	3/17/00	3/31/00	-2 w

Areas of Concern

Technical

None

Schedule

None

Personnel

We are seeking additional collaboration help on a DAQ and file storage monitoring task. This is not essential for operation, but would considerably aid in operation of the DAQ system. There are several candidates for the task.

Cost

There is some concern about the Operating funds that will be available to the Online system as Run II progresses. As the power and effectiveness of computing rapidly progresses, the benefits of additional new data monitoring systems are enormous. There should be an allowance for continued upgrades.

Change Requests

None

Progress Summary

- The Online system has continued to provide a stable platform for the commissioning of the detector elements.
- We used several Online group meetings during October to survey progress and remaining tasks. There are no major outstanding issues. We do envision the need for extended testing and monitoring as more system components are integrated; a manpower need for this is noted above.
- The order for the third and principal Online UNIX host machine was placed. Considerable design review and performance evaluation efforts preceded the final hardware decision.
- Six Linux nodes were installed in the Control Room.
- Performance measurements were made on Fibre Channel disk systems. There appears to be a straightforward and cost effective solution for the data buffer disks needed on the Online host systems.
- The Controls group continues to release a number of useful applications built upon a standard GUI framework and standard hardware access tools. Detector developers are using these standard tools to produce specialized control and monitoring applications.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

October '00 Financial Summary

The first month of fiscal year 2001 closed with obligations for the DØ Upgrade Project totaling \$597K on equipment M&S funds. While a month-to-month Project spending plan has not been established, in order to meet completion deadlines the majority of FY01 equipment funds are expected to be obligated in the first half of the fiscal year. Due to a continuing resolution during the month of October, the Project has not yet been allocated an FY01 M&S budget.

The M&S Upgrade Project balance is currently \$2,805K, excluding contributions and contingency. Contributions to the Upgrade currently total \$1,442K. These contributions reduce the M&S balance. DØ Upgrade Spokespersons have been negotiating additional contributions of approximately \$385K, but at this time, not all the funds have been specified. Because the Project managers routinely re-evaluate funding needs, the Estimate-to-Complete (ETC) continues to be synonymous with the Project's M&S balance. The overall cost of the Project has increased. The contingency, which is held by the Directorate, further increases the total Project cost. The total Cost Estimate increased by \$100K during October as a result of a contingency usage request approved by the Directorate. Additional contingency requests are expected to be presented in early FY01 following the Lehman review scheduled for November '00.

The Project currently has commitments with universities and other institutions in the DØ Collaboration, via active Memoranda of Understanding (MoU), totaling \$5,821K. These funds represent an obligation on the part of the DØ Upgrade Project and are regularly costed each month via invoices received from these institutions as work is completed. In addition, several institutions have made significant contributions to the DØ Upgrade. A list of the institutions involved, as well as a more detailed breakdown of the commitments and costs, follows.

DØ Upgrade Monthly Progress Report

for the month of October, 2000

FY01 Financial Report as of 10/31/00

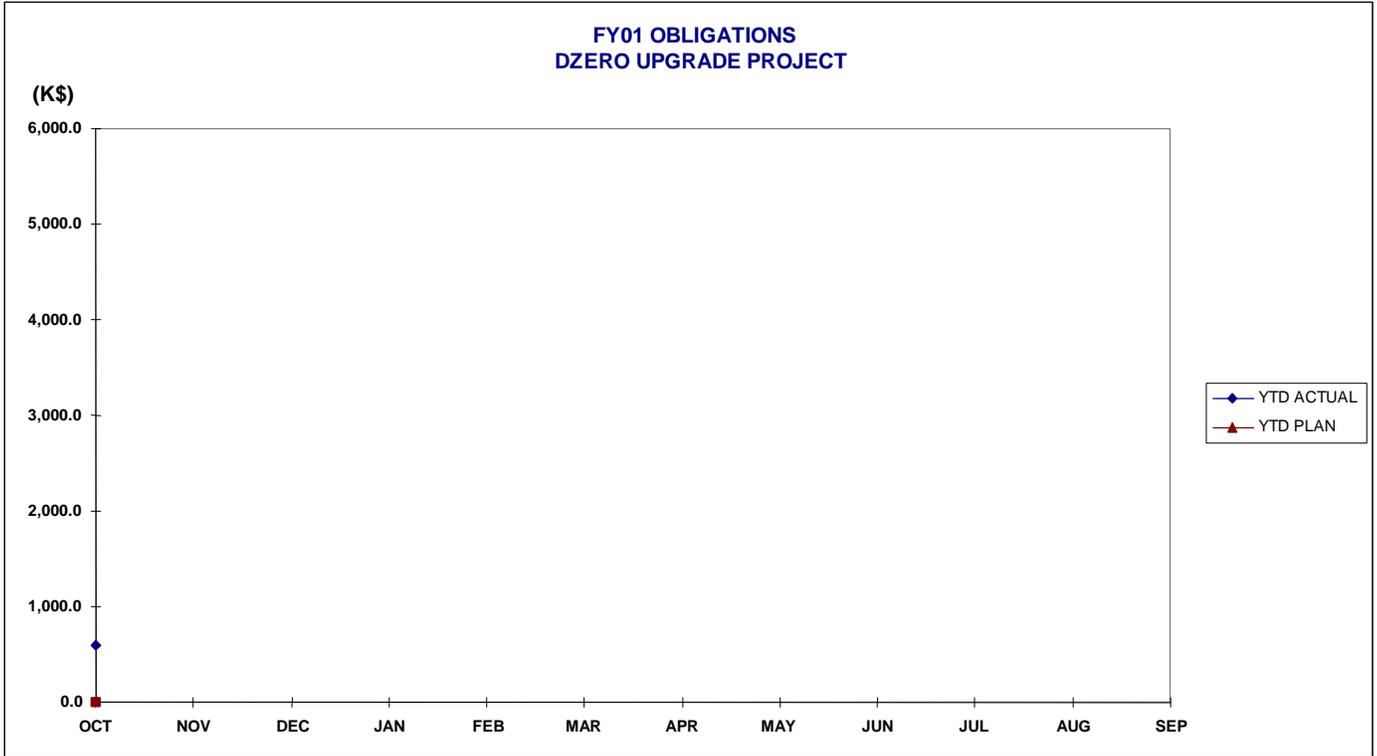
	<u>COST ESTIMATE</u>	<u>PRIOR YR OBLIG</u>	<u>FY 01 YTD OBLIG</u>	<u>PROJECT BALANCE</u>
1 TOTAL DZERO UPGRADE PROJECT	42,176.2	38,774.3	597.4	2,804.6
1.1 TRACKING DETECTORS	20,552.7	19,795.1	315.8	441.9
1.1.1 SILICON TRACKER	8,212.2	7,924.0	154.0	134.2
1.1.2 FIBER TRACKER	7,874.3	7,697.6	95.0	81.7
1.1.3 CENTRAL PRESHOWER DETECTOR	238.2	228.7	0.0	9.5
1.1.4 FORWARD PRESHOWER DETECTOR	524.3	514.9	0.0	9.4
1.1.5 TRACKING ELECTRONICS	3,703.7	3,429.8	66.8	207.0
1.2 CALORIMETER	4,711.8	4,489.2	0.0	222.6
1.2.1 FRONT-END ELECTRONICS	4,402.6	4,180.2	0.0	222.5
1.2.2 INTERCRYOSTAT DETECTOR	309.2	309.0	0.0	0.2
1.3 MUON DETECTORS	9,493.1	8,568.2	67.7	857.1
1.3.1 COSMIC RAY SCINTILLATOR	1,223.2	963.2	0.0	260.0
1.3.2 CENTRAL TRIGGER DETECTORS	951.9	793.2	0.4	158.3
1.3.3 FORWARD TRIGGER DETECTOR	2,133.3	1,766.8	51.4	315.1
1.3.4 FORWARD TRACKING DETECTOR	1,410.8	1,297.2	13.3	100.3
1.3.5 FRONT-END ELECTRONICS	3,773.9	3,747.8	2.6	23.5
1.4 TRIGGER	6,672.6	5,276.9	181.1	1,214.6
1.4.1 FRAMEWORK	1,859.4	1,859.4	0.0	0.0
1.4.2 LEVEL 0	136.4	130.6	2.2	3.6
1.4.3 LEVEL 1	1,588.0	1,356.0	0.0	232.0
1.4.4 LEVEL 2	2,039.8	1,104.5	178.9	756.4
1.4.5 LEVEL 3	1,049.0	826.5	0.0	222.6
1.5 ONLINE EQUIPMENT	746.0	644.9	32.7	68.3
1.5.1 ON-LINE EQUIPMENT	746.0	644.9	32.7	68.3

DEFINITION OF TERMS:

Funds: DØ Upgrade = M&S Equipment Funds; Solenoid = AIP Plant Funds.
 Cost Estimate: Total Project and Sub-Project estimates without contingency.
 Prior Year Obligations: Obligations for fiscal years '92 through '00 as applicable.
 FY 01 Year-to-Date Obligations: Obligations for fiscal year '01.
 Project Balance: Cost Estimate - (Prior Year Obligations + Fiscal 01 YTD Obligations)

DØ Upgrade Monthly Progress Report

for the month of October, 2000



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
YTD ACTUAL	597.4											
YTD PLAN												

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Active MOUs as of 10/31/00

<u>INSTITUTION</u>	<u>EQUIPMENT</u>	<u>R&D</u>	<u>COSTED</u>
Boston University	298,200	5,200	82
Brookhaven National Laboratory	236,439		181
Brown University	820,076	106,000	211
California State University, Fresno	26,160		17
Columbia University, Nevis Labs	140,000		127
Indiana University	65,000		60
Institute for High Energy Physics (IHEP)	270,433		168
Kansas State University	113,300	92,512	138
Louisiana Tech University	98,856		60
Michigan State University	384,238	176,000	83
Northern Illinois University	133,000	28,000	141
SUNY at Stony Brook	1,273,567	20,000	613
University of Arizona	790,598	26,600	503
University of Calif, Davis		9,720	9
University of IL, Chicago	129,103	22,000	91
University of Kansas, Center for Research, Inc.	16,000		12
University of Notre Dame	68,000	199,500	273
University of Oklahoma	43,000		36
University of Texas, Arlington	162,886		120
<u>University of Washington</u>	<u>60,188</u>	<u>6,200</u>	<u>66</u>
Total Fermilab Funds:	<u>\$5,129,044</u>	<u>\$691,732</u>	
Total Costed:	2,668,489	332,000	<u>\$3,000,489</u>
Total Open Commitments:	<u>\$2,460,555</u>	<u>\$359,732</u>	

DØ Upgrade Monthly Progress Report

for the month of October, 2000

Reportable Milestones Summary

<u>Done</u>	<u>Reportable Milestones</u>	<u>Project</u>	<u>Date</u>	<u>Baseline</u>	<u>Var.</u>
X	M1-Solenoid Delivered to Fermilab	Solenoid	5/12/97	5/12/97	0 w
X	M2-VLPC Production 50% Complete	VLPCs	8/31/97	8/31/97	0 w
X	M2-Central Preshower Module Fabrication Complete	Central Preshower	12/16/97	12/16/97	0 w
X	M2-Central Preshower Installed on Solenoid	Central Preshower	5/21/98	5/21/98	0 w
X	M1-Solenoid Installed and Tested	Solenoid	9/30/98	9/30/98	0 w
X	M2-Muon Forward Trigger Counter Assembly 10% Complete	Muon Forward Trigger	10/12/98	10/12/98	0 w
X	M2-Forward Preshower Module Fabrication Begun	Forward Preshower	11/4/98	11/4/98	0 w
X	M2-Muon Forward Tracker MDT Assembly 10% Complete	Muon Forward Tracker	1/29/99	1/29/99	0 w
X	M2 - Assembly Design Complete	Fiber Tracker	3/5/99	3/5/99	0 w
X	M2-First Cylinder Complete	Fiber Tracker	9/2/99	9/2/99	0 w
X	H Half-Wedge Fabrication 20% Complete	Silicon Tracker	10/15/99	10/15/99	0 w
X	3 Chip Ladder Fabrication 80% Complete	Silicon Tracker	10/26/99	10/20/99	0.6 w
X	Arrival Of C-Layer MDT Modules At FNAL	Muon Forward Tracker	11/3/99	10/22/99	1.7 w
X	9 Chip Ladder Fabrication 20% Complete	Silicon Tracker	11/4/99	11/3/99	0.2 w
X	M3-Fiber Tracker Ribbon Fabrication 50% Complete	Fiber Tracker	11/5/99	11/12/99	-0.9 w
X	First Readout Crate Installed & Working	Silicon Electronics	11/16/99	12/2/99	-2 w
X	SCA Testing Complete	Calorimeter Electronics	11/23/99	12/15/99	-2.8 w
X	MDT ADB Fabrication Complete	Muon Electronics	12/2/99	12/2/99	0 w
X	SLICs Received	Trigger	12/10/99	11/10/99	4 w
X	F Wedge Assemblies 20% Complete	Silicon Tracker	1/24/00	1/19/00	0.4 w
X	6 Chip Ladder Fabrication 20% Complete	Silicon Tracker	1/31/00	1/3/00	3.9 w
X	MDC Fabrication Complete	Muon Electronics	1/31/00	12/13/99	5 w
X	M2-Muon Electronics Preproduction Installation Complete	Muon Electronics	1/31/00	12/13/99	5 w
X	M2-Fiber Tracker Assembly Begun	Fiber Tracker	2/1/00	12/6/99	6.2 w
X	M3-Establish Single Crate Internal Data Movement	Trigger	2/17/00	1/6/00	6 w
X	Shaper Hybrid 50% Complete	Calorimeter Electronics	2/22/00	5/9/00	-11 w
X	All Pixel Octants Assembled	Muon Forward Trigger	2/23/00	4/4/00	-5.8 w
X	M3-1st Forward Preshower Detector Complete	Forward Preshower	2/24/00	1/12/00	6.2 w
X	M3-Fiber Tracker Cylinders 8, 7, 6, and 5 Complete	Fiber Tracker	3/2/00	1/28/00	5 w
X	Steady DAQ Running	Online	3/17/00	3/31/00	-2 w
X	H Half-Wedge Fabrication 80% Complete	Silicon Tracker	3/29/00	2/23/00	5 w
X	M2-All Muon Forward Tracker MDT Modules At Fermilab	Muon Forward Tracker	3/30/00	3/10/00	2.8 w
X	Module Fabrication and Testing Complete	Forward Preshower	4/1/00	12/10/99	14 w
X	M3-2nd Forward Preshower Detector Complete	Forward Preshower	4/3/00	3/8/00	3.6 w
X	FEB, CB Production Complete	Muon Electronics	4/10/00	1/3/00	14 w
X	M3-ICD Tile Modules/Boxes Ready	Intercryostat Detector	4/19/00	1/18/00	13.2 w
X	M2-ICD Modules Arrive at Fermilab	Intercryostat Detector	4/24/00	1/25/00	12.8 w
X	M3-InterCryostat Detectors Installed	Intercryostat Detector	5/5/00	2/1/00	13.6 w
X	M3-Level Ø-South Installed	Luminosity Monitor	5/8/00	2/9/00	12.6 w
X	M3-Fiber Tracker Ribbon Fabrication Complete	Fiber Tracker	5/10/00	3/6/00	9.5 w
X	M3-Fiber Tracker Ribbon Mounting Complete	Fiber Tracker	5/13/00	4/20/00	3.3 w
X	M2-Fiber Tracker Assembly Complete	Fiber Tracker	5/26/00	5/4/00	3.3 w
X	6 Chip Ladder Fabrication 80% Complete	Silicon Tracker	7/12/00	3/14/00	16.8 w
X	M2-Calorimeter Preamp System Test Complete	Calorimeter Electronics	7/13/00	3/31/00	14.4 w
X	Low Mass Cables Available For Silicon South	Silicon Tracker	7/17/00	NA	0 w
X	Waveguide Production 50% Complete	Fiber Tracker	7/24/00	1/29/00	24.6 w
X	10 Digital Boards Available	Fiber Electronics	7/28/00	3/22/00	18 w
X	9 Chip Ladder Fabrication 80% Complete	Silicon Tracker	7/31/00	3/27/00	17.4 w
X	F Wedge Assemblies 80% Complete	Silicon Tracker	7/31/00	4/26/00	13.2 w
X	M2-Muon End Toroids Installed on Platform	Master	8/4/00	11/15/00	-14.2 w
X	Ten 8-chip Analog Boards Available	Fiber Electronics	8/8/00	4/19/00	15.4 w
X	M3-VLPC Cryo System Operational	VLPCs	8/18/00	6/12/00	9.6 w
X	B-Layer Octants Assembled	Muon Forward Tracker	8/24/00	4/18/00	18 w

DØ Upgrade Monthly Progress Report

for the month of October, 2000

X	All MDT Octants Assembled	Muon Forward Tracker	8/24/00	7/14/00	5.8 w
X	Low Mass Cables Available for Silicon North	Silicon Tracker	9/4/00	NA	0 w
X	M3-VLPC Cassette Assembly 50% Complete	VLPCs	9/13/00	4/12/00	21.5 w
X	M2-First Silicon Tracker Barrel/Disk Module Complete	Silicon Tracker	9/14/00	1/24/00	33 w
X	SFE, SRC Fabrication Complete	Muon Electronics	9/21/00	2/3/00	32.5 w
X	South H-Disks Ready to Move to DAB	Silicon Tracker	10/13/00	7/3/00	14.4 w
X	MRC, MFC Production Complete	Muon Electronics	10/18/00	3/27/00	28.8 w
X	Preproduction MTCxx, MTFB, and MTCM Complete	Trigger	10/19/00	1/24/00	38 w
X	South Half-Cylinder Complete and Ready to Move to DAB	Silicon Tracker	10/25/00	8/1/00	12.2 w
X	M1-Begin Shield Wall Removal/Ready to Roll-in	Master	11/7/00	11/22/00	-2.2 w
X	M3-Waveguide Production Complete	Fiber Tracker	11/7/00	6/5/00	22 w
X	M3-Muon Level 1 Trigger Preproduction Testing Complete	Trigger	11/8/00	4/18/00	28.6 w
	M3-All Silicon Tracker Barrels/Disks Complete	Silicon Tracker	11/20/00	8/25/00	12.2 w
	MBTs Received	Trigger	11/30/00	3/16/00	36 w
	North Half-Cylinder Complete and Ready to Move to DAB	Silicon Tracker	12/12/00	9/18/00	12 w
	M1-Central Silicon Complete	Silicon Tracker	12/12/00	9/18/00	12 w
	Daughterboard Vendor Production Complete	Calorimeter Electronics	12/13/00	6/16/00	24.8 w
	Timing System Installed	Calorimeter Electronics	12/13/00	8/18/00	16 w
	M3- Cal Readout Available to L2	Trigger	12/13/00	2/11/00	42.6 w
	M3-Calorimeter CC, ECN Preamp Installation Complete	Calorimeter Electronics	12/19/00	3/31/00	36.4 w
	Drawers Ready	Intercryostat Detector	12/20/00	12/14/99	50.2 w
	Muon Forward Tracker B-Layer Planes Installed	Muon Forward Tracker	12/21/00	6/15/00	26.2 w
	All MDT Planes Installed	Muon Forward Tracker	12/21/00	8/4/00	19.2 w
	M3-L3 Operational (One Full Chain)	Trigger	1/2/01	6/1/00	29 w
	M2-Silicon Tracker Installed in Solenoid/Fiber Tracker	Silicon Tracker	1/4/01	9/25/00	13.6 w
	All Muon Forward Trigger Detector Planes Installed	Muon Forward Trigger	1/15/01	8/25/00	18.8 w
	BLS Motherboard Assembly Complete	Calorimeter Electronics	1/29/01	8/7/00	23.6 w
	Multichip Modules Received	Fiber Electronics	1/30/01	2/23/00	47 w
	Mixer Boards Ready	Fiber Electronics	1/31/01	6/22/00	30.2 w
	Production MTCxx, MTFB, and MTCM Complete	Trigger	2/2/01	6/27/00	30 w
	M2-Calorimeter BLS Assembly Complete	Calorimeter Electronics	2/5/01	9/26/00	17.6 w
	M3-VLPC Cassette Assembly Complete	VLPCs	2/12/01	8/22/00	23.4 w
	CFA Commissioning Complete	Muon Central	2/15/01	7/10/00	30.3 w
	PDT Commissioning Complete	Muon Central	2/20/01	6/9/00	34.8 w
	M1-Detector Rolled-in and Hooked Up	Master	2/22/01	2/2/01	2.8 w
	Global Installation Complete	Trigger	3/2/01	7/12/00	32 w
	L2 Cal Installation Complete	Trigger	3/2/01	8/21/00	26.4 w
	Alpha Cards Received	Trigger	3/30/01	5/15/00	44 w
	L2 Muon Installation Complete	Trigger	4/27/01	7/26/00	38 w
	L2 CTT Installation Complete	Trigger	4/27/01	8/9/00	36 w
	M3-Trigger Level 2 Commissioned	Trigger	6/4/01	9/21/00	35 w