

DØ Upgrade Monthly Progress Report

for the month of May, 2000

Subsystem: Master Schedule and Overview
WBS: All
Date Submitted: 6/26/00
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
	M2-Muon End Toroids Installed on Platform	7/25/00	11/15/00	-15.8 w
	M1-Begin Shield Wall Removal/Ready to Roll-in	11/13/00	11/22/00	-1.4 w
	M1-Detector Rolled-in and Hooked Up	2/16/01	2/2/01	2 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

Refer to the WBS level 3 system reports.

Schedule

The remaining schedule concerns are related to the silicon subsystem.

Resources

None

Cost

None

Change Requests

None

Progress Summary

- The fiber tracker mechanical construction was completed and efforts in this area have now shifted to waveguide production.
- The forward muon system is being installed (A-layer MDTs), the C-layer MDT octant assembly is complete, and all pixel counter octants have been fabricated. The B-layer MDT octants remain to be done.
- The forward detectors (FPS, ICD, and Luminosity Monitor) were all installed.
- The silicon detector is still in production, but it is clear that the first half will be ready in August. Sensor and HDI deliveries for the second half remain a concern, but not a real worry.
- Commissioning of the detector continues.

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Subsystem: Silicon Tracker
WBS: 1.1.1
Date Submitted: 6/26/00
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
	F Wedge Assemblies 80% Complete	6/20/00	4/26/00	7.6 w
	9 Chip Ladder Fabrication 80% Complete	6/27/00	3/27/00	13 w
	M2-First Silicon Tracker Barrel/Disk Module Complete	6/28/00	1/24/00	22.2 w
	6 Chip Ladder Fabrication 80% Complete	7/12/00	3/14/00	16.8 w
	South H-Disks Ready to Move to DAB	8/4/00	7/3/00	4.6 w
	South Half-Cylinder Complete and Ready to Move to DAB	8/10/00	8/1/00	1.6 w
	M3-All Silicon Tracker Barrels/Disks Complete	10/27/00	8/25/00	9 w
	North Half-Cylinder Complete and Ready to Move to DAB	10/27/00	9/18/00	6 w
	M1-Central Silicon Complete	10/27/00	9/18/00	6 w
	M2-Silicon Tracker Installed in Solenoid/Fiber Tracker	12/15/00	9/25/00	11.6 w

Areas of Concern

Technical

- We have found some ladders where the usual silver epoxy techniques for grounding failed over time. This was determined to be due to oxide formation on the surface. We have investigated a number of techniques and have moved to indium solder joints that provide reliable grounds.
- There is a cross-talk problem in our low-mass cable that sometimes causes additional data strobes.

Schedule

- Parts deliveries continue to be a concern. Nine-chip ladder production is limited by HDI availability. Six-chip ladder production is paced by the delivery of sensors. We are also monitoring the production rate of low-mass cables at the DOE Kansas City Honeywell plant.
- Production of the interface cards is awaiting resolution of the cross-talk problems mentioned above.

Resources

A number of experienced physicists will leave the project during the summer to take other positions or to return from visiting positions at Fermilab. We are concerned that this loss may slow the project.

Cost

There is continued cost exposure in the installation, cooling, and final assembly tasks.

Change Requests

None

Progress Summary

- The first barrel and two disks of the DØSMT have been assembled. The second barrel is underway and has benefited from the lessons learned on the first barrel.
- The 10% test continues to be an important system to test and debug electronics and systems. We hope to read out a disk with this system in late June.

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- Mechanical work on the half-cylinder assemblies is progressing well, with the cylinders expected to be ready for installation in the central fiber tracker in June.
- Ladder and wedge production and testing is proceeding smoothly, with the rate limited by parts availability and capacity of the burn-in testing systems.

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for the month of May, 2000

Subsystem: Fiber Tracker and VLPCs
WBS: 1.1.2
Date Submitted: 6/22/00
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
	Waveguide Production 50% Complete	7/12/00	1/29/00	23.1 w
	M3-Waveguide Production Complete	8/16/00	6/5/00	10.4 w
	<i>VLPCs</i>			
X	M2-VLPC Production 50% Complete	8/31/97	8/31/97	0 w
	M3-VLPC Cryo System Operational	7/18/00	6/12/00	5 w
	M3-VLPC Cassette Assembly 50% Complete	8/17/00	4/12/00	17.8 w
	M3-VLPC Cassette Assembly Complete	10/13/00	8/22/00	7.4 w

Areas of Concern

Technical

None

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

- The Fiber Tracker is mechanically complete and will be installed in June.
- Waveguide final production is underway (approximately forty complete).
- Fourteen production cassettes complete.

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Subsystem: Forward Preshower
WBS: 1.1.4
Date Submitted: 6/16/00
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

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

- Collection of survey data taken during FPS installation was analyzed to determine the final location of the detectors within the DØ global reference frame.
- Initial designs for the LED calibration/monitoring system pulsers were developed.
- A prototype 15-m FPS waveguide was routed about the north EC head, from the installed FPS detector to the designated VLPC location below the platform, in order to stage and understand the final cable lengths, strain relieving and clearances required prior to production and installation.
- Final prints were made for the installation of four cable winders for FPS waveguides that allow fiber articulation during EC movement. Machining of all required mounting hardware is expected during June 2000.

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Subsystem: Tracking Electronics
WBS: 1.1.5
Date Submitted: 6/26/00
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
	Ten 8-chip Analog Boards Available	7/11/00	4/19/00	11.4 w
	10 Digital Boards Available	7/13/00	3/22/00	15.7 w
	Multichip Modules Received	8/25/00	2/23/00	26 w
	Mixer Boards Ready	11/10/00	6/22/00	19.8 w

Areas of Concern

Technical

None

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

Silicon Electronics

- Work continued on getting multiple crate readout working. Individual crates now work OK.
- Rack prep for the sequencer crates in the central region of the platform was finished except for two crates that are in test stands. Cable installation for the sequencer to interface crates was started.
- The PC boards and parts for the SVX emulators were received. They will be assembled next month. One SVX emulator board and a sequencer are installed in the moving counting house for software development and tests.

Fiber Electronics

- The multi-chip-module (MCM) substrate design was released on June 9 and production of the substrate has started. The packaging of the modules will begin in 8 to 10 weeks from this date. Extensive work was done in qualifying the MCM production test stand.
- The analog front-end 8-chip board (AFE8, 8-MCM) board was released for production of the first ten units on June 9. Boards are expected back by four weeks from that date. Layout of the two -board pair for the 12-MCM AFE was stretched out because the layout resources were used for the 8-MCM board and the mixer backplane.
- Work on the mixer box design continued. The special design tool was in use. Other details of the design such as the clock distributions, handling of the control bits and synchronization of the system were worked on. The system is near design completion.
- The first production articles of the Digital Motherboard were received and tested OK.
- The first-article DFE tracking daughter boards are expected on July 1.

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Subsystem: Calorimeter Electronics
WBS: 1.2.1
Date Submitted: 6/13/00
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 w
	M2-Calorimeter Preamp System Test Complete	7/13/00	3/31/00	14.4 w
	M3-Calorimeter CC, ECN Preamp Installation Complete	7/20/00	3/31/00	15.4 w
	Timing System Installed	9/18/00	8/18/00	4 w
	Daughterboard Vendor Production Complete	10/4/00	6/16/00	15.2 w
	BLS Motherboard Assembly Complete	11/22/00	8/7/00	15.2 w
	M2-Calorimeter BLS Assembly Complete	1/8/01	9/26/00	13.6 w

Areas of Concern

Technical

- Progress was made in reducing the coherent noise in the BLS system, however we have not yet achieved the same level of performance achieved in Run I. We continue to investigate and make improvements.
- The temperatures in the preamp boxes have been measured with the new cooling system. The distribution of temperatures is larger than desired, and we continue to optimize the airflow distribution.

Schedule

- The slippage of the Director's "Calorimeter Preamp System Test Complete" milestone is due primarily to delays in the installation of the cooling system. The final mechanical parts are expected by mid-June. The preamp system is far from critical path for the calorimeter electronics project and hence does not affect the end date of this schedule.
- The BLS power supply rework has been delayed by slow delivery of transformers from the vendor. If the new delivery date of June 9 holds, then this should not adversely affect the schedule.
- Since the BLS electronics is on the critical path, we have decided to take the risk and produce the pre-production order of 150 motherboards. We have implemented changes on the layout that should allow us to address the coherent noise problems discussed above, and we expect the risk to be small.

Resources

There has been a slow erosion of technical manpower (bench tech and electro-mechanical tech), but for the moment, that may be covered by an influx of summer student help. It is too soon to say whether the project will be adversely effected in the Fall because of a shortage of technical manpower. The project has been helped by the addition of a group from Mainz that has agreed to take responsibility for the argon purity measurements and monitoring.

Cost

There are no changes to the cost. However, we have noticed that parts availability is poor in general, with either long lead times or higher-than-normal costs for stock parts. We are monitoring this situation.

Change Requests

None

Progress Summary

- Sources of coherent noise in the pulser system were identified and fixed.
- BLS coherent noise has been reduced with additional bypassing, improvements continue to be made.
- The preamp cooling system parts are 90% complete.
- About 1100 (of 1250) preamp motherboards have been populated and tested.
- 500 pre-production BLS daughtercards have been assembled and tested.

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- An order for 150 pre-production BLS motherboards has been placed.
- The BLS power supply rework is well underway; ~50% of the control boards have been modified and power supplies gutted in preparation for the new transformer installation.
- Calibration system power supplies are under construction.
- We continue to prepare the documentation for the BL system safety review.
- Read out preamps on the detector using the new pulser calibration system and the old BLS through DAQ system. The DAQ system for the calorimeter is being exercised.

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Subsystem: Intercryostat Detector
WBS: 1.2.2
Date Submitted: 6/20/00
Submitted By: Andy White

<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	8/25/00	12/14/99	34.2 w

Areas of Concern

Technical

Prototype fiber cables are expected this week, however, this will remain a concern until production cables are in hand.

Schedule

We now foresee installing the two North end crate/block/backplane assemblies in early September. Commissioning of the North end will occur in Sept/Oct. Installation of the South end systems will follow in November.

Resources

None

Cost

The estimates for the fiber cable assemblies will allow their purchase at a cost within the original estimate plus the additional amount added by the review committee.

Change Requests

None

Progress Summary

- All Motherboards have been stuffed.
- Jigs have been developed to allow precise positioning of the polished ends of the clear fibers in the backplanes into the cookies in front of the PMTs.
- A major effort is underway at Louisiana Tech to produce final cables.
- The muon LMBs for the ICD have been delivered to University of Texas-Arlington.
- We have hired an additional student to help with the fiber backplane assembly work.

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Subsystem: Muon Central
WBS: 1.3.2
Date Submitted: 6/26/00
Submitted By: Tom Diehl

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
	PDT Commissioning Complete	10/17/00	6/9/00	18 w
	CFA Commissioning Complete	11/22/00	7/10/00	19.3 w

Areas of Concern

Technical

- Progress continues to be slow on the two central muon gas systems. Much of the installation of on-detector components such as the headers and distribution lines is finished, but gas isn't flowing because we lack connections to the gas room that will allow us to operate off a gas trailer. Without those connections, our commissioning is severely limited.
- We expect to get stuck at 50% front-end electronics installed and connected for the remainder of the summer since scintillator front-end cards (SFE's) are coming in late. The forward muon system should have priority, for the short term, in attaining any newly available SFEs.

Schedule

Commissioning has (finally) started in earnest in all aspects of the central muon system.

Resources

Commissioning manpower resources have lingered at 4.75 FTE's for the month of May. Still, there are no post-docs.

Cost

None.

Change Requests

None.

Progress Summary

- We have achieved a minor breakthrough in PDT commissioning in that we have readout the first two using final production-run front-end electronics.
- We have achieved a minor breakthrough in scintillation counter commissioning in that we began to readout the first scintillation counter front-end crate with final production-run front-end electronics.

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for the month of May, 2000

Subsystem: Muon Forward Trigger Detectors
WBS: 1.3.3
Date Submitted: 6/12/00
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	1/9/01	8/25/00	18 w

Areas of Concern

Technical

None

Schedule

Installation of the forward trigger detectors has been delayed relative to the schedule. The major reason is delay in the engineering and drafting for support structures.

Resources

None

Cost

None

Change Requests

None

Progress Summary

- Three-month tests of two fully assembled trigger counters octants demonstrated no problems.
- Commissioning of 288 channels of high-voltage system has been finished, and the system is ready to be connected to phototube bases.
- Commissioning of front-end electronics and DAQ system has started, with the first VME crate installed in the trusses and connected to the DØ DAQ system.
- Design of A-layer planes supports has been finished and drafting started.
- Design of C-layer mounting structures has started.

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Subsystem: Muon Forward Tracker
WBS: 1.3.4
Date Submitted: 6/12/00
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
	B-Layer Octants Assembled	9/1/00	4/18/00	19.2 w
	All MDT Octants Assembled	9/1/00	7/14/00	7 w
	Muon Forward Tracker B-Layer Planes Installed	11/30/00	6/15/00	23.2 w
	All MDT Planes Installed	11/30/00	8/4/00	16.2 w

Areas of Concern

Technical

None

Schedule

About a one month delay occurred in C-layer MDT octants assembly. About the same delay has occurred in installation of A-layer detectors.

Resources

None

Cost

None

Change Requests

None

Progress Summary

- Full-scale assembly and tests of MDT C-layer octants has started and eight of sixteen octants have been completed. Preliminary test results demonstrate that MDT C-layer octant parameters are well within specifications.
- Design of C-layer MDT supports has been finished and production has started.
- Twelve A-layer octants have been installed.
- Eight installed A-layer octants have been tested (gas leaks, high voltage, and low voltage front-end electronics tests) and are within specifications. One installed octant has been tested successfully using a radioactive source and cosmic rays.

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Subsystem: Muon Electronics
WBS: 1.3.5
Date Submitted: 6/20/00
Submitted By: Boris Baldin

<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
	SFE, SRC Fabrication Complete	6/27/00	2/3/00	20.5 w
	MRC, MFC Production Complete	9/1/00	3/27/00	22.4 w

Areas of Concern

Technical

None

Schedule

SFE production is delayed by the vendor because of part delivery problem from Analog Devices

Resources

None

Cost

None

Change Requests

None

Progress Summary

- MDRC and TFC production are complete.
- All projects except SFE, SLP, and MFC have finished production.

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Subsystem: Trigger
WBS: 1.4.1-1.4.5
Date Submitted: 6/21/00
Submitted By: Gerald C. Blazey and Nikos Varelas

<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
	M3-L3 Operational (One Full Chain)	6/29/00	6/1/00	4 w
	MBTs Received	6/30/00	3/16/00	15 w
	Preproduction MTCxx, MTFB, and MTCM Complete	7/12/00	1/24/00	24 w
	M3- Cal Readout Available to L2	8/15/00	2/11/00	26 w
	Global Installation Complete	9/7/00	7/12/00	8 w
	L2 Cal Installation Complete	9/7/00	8/21/00	2.4 w
	L2 CTT Installation Complete	9/7/00	8/9/00	4 w
	Production MTCxx, MTFB, and MTCM Complete	9/21/00	6/27/00	12 w
	L2 Muon Installation Complete	9/21/00	7/26/00	8 w
	M3-Muon Level 1 Trigger Preproduction Testing Complete	10/20/00	4/18/00	26 w
	Alpha Cards Received	12/18/00	5/15/00	30 w
	M3-Trigger Level 2 Commissioned	2/2/01	9/21/00	18 w

Areas of Concern

Technical

Initial integration tests of the Level 2 CIC and SFO prototype boards at the DØ Test Stand showed some transmission errors. Investigations are underway.

Schedule

None

Resources

We lost a very important member of the Level 2 group when Rob Martin, in charge of debugging the Level 2 Alpha boards, left for a job in industry.

Cost

None

Change Requests

None

Progress Summary

Framework

Progress on the Level 1 and Level 2 trigger framework continued.

- All cables and connectors for the Serial Command Link were delivered to DØ.
- The VIPA crate for the readout from the trigger framework was installed and established communication with the Trigger Control Computer.

Level Ø

- The luminosity monitor detectors were installed on the detector in early May, following the installation of the Forward Preshower that provides the mechanical support.
- Progress also was made on the luminosity monitor electronics.

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Level 1

- Testing of the pre-production version of the muon trigger card (MTCxx) and its associated flavor boards (MTFB's) continued.
- The delivery of the serial link daughter boards (SLDB's) from the assembly house has incurred a significant delay.
- The pre-production MCEN cards were delivered and they are ready to be tested once the debugging of the Level 2/Level 3 data path from the crate manager (MCCM) to the Level 1 Muon test card (MTT) is complete.
- Integration of the Level 1 Muon trigger into the DØ DAQ system continued.
- The Level 1 Central Track Trigger Analog Front End 8-chip (8-MCM) board was released for production of the first ten units.
- The first production articles of the Digital Motherboard were received and tested successfully.
- Firmware for the clustering of strips in the Level 1 Forward Preshower was written and simulated.
- A circuit board to receive the Trigger Pickoff signals in Level 1 Calorimeter was completed and it was sent out for a quick run of four prototypes.

Level 2

- The Level 2 Alpha processor boards were approved for a first-round production of twenty-five boards, sufficient for first-year running needs. These boards do not have a working Level 3 cache, but should be sufficient for the applications we can foresee at this time. The partial production will allow installation and commissioning to proceed, and allow evaluation over the summer of whether we are likely to have applications which actually require a working Level 3 cache on the board.
- Fermilab provided the Level 2 test stand with much-needed engineering help in the form of an engineer available for consultation through the commissioning phase of Level 2.
- The testing of the communication path FIC-to-SFO-to-SLIC and Muon front-end to CIC continued. Potential causes for some of transmission errors were identified and the testing of the communication paths to these boards continues.
- All Level 2 UTP hot-link cables were ordered and are expected to arrive at DØ next month.
- Significant progress was made in developing a complete Level 1/Level 2 trigger simulation path for calorimetry.

Level 3

- A second Level 3/DAQ standalone system was developed for the Silicon detector.
- Work on integrating Level 3 filtering with new interfaces continued. A first pass trigger list was developed to exercise all functional Level 3 tools and filters for the integrated tests under production releases.

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Subsystem: Online
WBS: 1.5.1
Date Submitted: 6/26/00
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

None

Cost

Currently evaluating disk subsystems for I/O performance. If adequate performance levels cannot be met with hardware in current plan, then there is a possibility that costlier solutions might be necessary. This issue is still under evaluation.

Change Requests

None

Progress Summary

Online activities included:

- Operation with multiple simultaneous DAQ runs, independently controlled and producing independent output streams. This is an essential achievement for allowing simultaneous commissioning activities of several detector elements.
- Demonstration of the calibration system. The complete calibration path was demonstrated for an element of the silicon detector system – control from a user interface, local data acquisition and analysis in a front-end processor, transmission of results to a host application, logging into an ORACLE database, and subsequent extraction of the calibration results. The SMT calibration mechanism is to be used as the model for all other SVX-based detectors.
- Replication of ORACLE data from Online to Offline systems. In May the process of automatically transmitting / replicating database information from the Online ORACLE tables to Offline databases was demonstrated. An automatic daemon performs the action. This function will be used to transfer run and monitoring information between systems.
- Prototype significant event system. The prototype significant event (alarm) server was demonstrated in May and now is continuously active. The application interface has been released. A simple scrolling display was also demonstrated. Work progresses on a more complicated graphical display.

The Online group continued to support commissioning activities at DØ, SiDet, and Lab 3.

DØ Upgrade Monthly Progress Report

for the month of May, 2000

May '00 Financial Summary

The month of May fiscal year 2000 closed with obligations for the DØ Upgrade Project totaling \$3,623K on equipment M&S funds. Obligations on Solenoid AIP Plant funds will no longer be reported since the project closed during the month of April 2000. The spending plan, which now shows that spending is exceeding plan for FY00, has been updated. At this stage of the Project, it seemed only crucial to plan for the future, thus the spending plan for October through April was made equal to spending. On the other hand, planned spending from May through September is a best estimate. The Project was allocated an M&S budget of \$3,104K during November. To cover Operating expenditures, the M&S budget was reduced by \$400K early in the fiscal year and an additional \$200K reduction occurred during April. DØ expects to spend the full FY00 budget, which is now \$2,504K. In addition to the Project's DoE funding, forward funding will be instituted to cover expenditures beyond the current fiscal year budget. A \$1,000K forward funding agreement has recently been established with SUNY Stony Brook. Michigan State University, the University of Notre Dame, and Northern Illinois University have also agreed to provide support. The remaining DoE funding of \$3,708K will be allocated during fiscal year 2001.

The M&S Upgrade Project balance is currently \$3,981K, excluding contributions and contingency. Contributions to the Upgrade currently total \$1,442K. These contributions reduce the M&S balance. DØ Upgrade Spokespersons are in the process of negotiating additional contributions of approximately \$385K, but at this time, these funds are still unspecified. A new Cost Estimate is now being used in the determination of Project's estimate to complete (ETC), which remains equal to the Project's M&S balance. The overall cost of the Project has increased. A contingency estimate was developed as a result of a PPD Cost Review, which took place during March. The contingency, which is held by the Directorate, further increases the total Project cost. The total Cost Estimate increased by \$71K during April as a result of contingency usage requests approved by the Directorate.

The Solenoid Project is now complete. The un-obligated AIP balance of \$282.4K will be transferred to Upgrade M&S Equipment as budget dollars to be spent this fiscal year. These budget dollars are expected to be transferred in June FY00.

The Project currently has commitments with universities and other institutions in the DØ Collaboration, via active Memoranda of Understanding (MoU), totaling \$4,915K. 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 universities and other institutions involved, as well as a more detailed breakdown of the commitments and costs, follows.

DØ Upgrade Monthly Progress Report

for the month of May, 2000

FY00 Financial Report as of 5/31/00

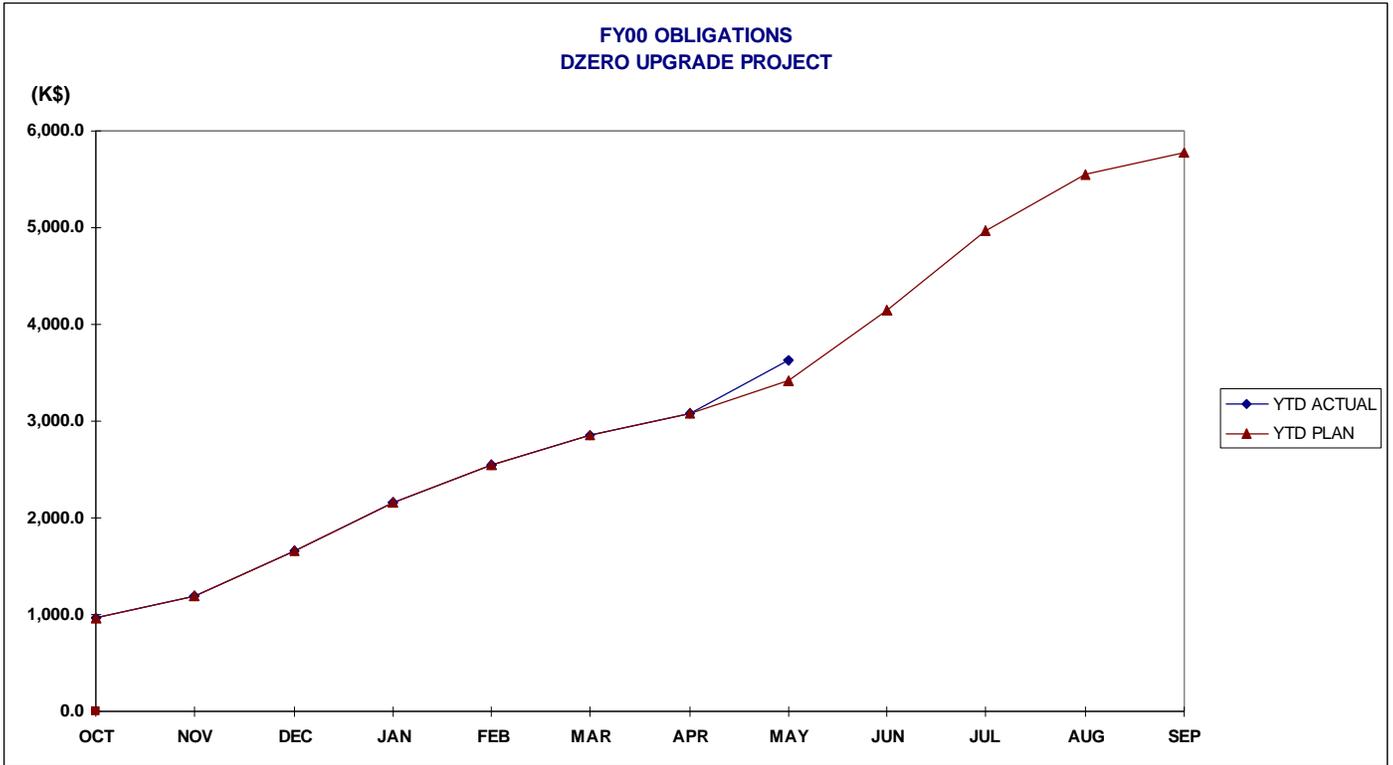
	<u>COST</u> <u>ESTIMATE</u>	<u>PRIOR YR</u> <u>OBLIG</u>	<u>FY 00</u> <u>YTD OBLIG</u>	<u>PROJECT</u> <u>BALANCE</u>
1 TOTAL DZERO UPGRADE PROJECT	41,593.2	33,989.2	3,623.2	3,980.9
1.1 TRACKING DETECTORS	20,097.6	16,773.0	2,409.6	914.9
1.1.1 SILICON TRACKER	7,857.1	6,166.1	1,293.7	397.2
1.1.2 FIBER TRACKER	7,774.3	6,976.3	670.9	127.2
1.1.3 CENTRAL PRESHOWER DETECTOR	238.2	228.2	0.0	10.0
1.1.4 FORWARD PRESHOWER DETECTOR	524.3	500.3	14.6	9.4
1.1.5 TRACKING ELECTRONICS	3,703.7	2,902.1	430.5	371.1
1.2 CALORIMETER	4,656.8	4,163.4	123.8	369.7
1.2.1 FRONT-END ELECTRONICS	4,347.6	3,915.5	83.4	348.7
1.2.2 INTERCRYOSTAT DETECTOR	309.2	247.9	40.4	20.9
1.3 MUON DETECTORS	9,493.1	7,839.9	595.9	1,057.3
1.3.1 COSMIC RAY SCINTILLATOR	1,223.2	963.2	0.0	260.0
1.3.2 CENTRAL TRIGGER DETECTORS	951.9	713.6	67.5	170.8
1.3.3 FORWARD TRIGGER DETECTOR	2,133.3	1,673.1	31.4	428.8
1.3.4 FORWARD TRACKING DETECTOR	1,410.8	953.8	331.5	125.5
1.3.5 FRONT-END ELECTRONICS	3,773.9	3,536.2	165.5	72.2
1.4 TRIGGER	6,599.6	4,919.5	324.3	1,355.8
1.4.1 FRAMEWORK	1,859.4	1,859.4	0.0	0.0
1.4.2 LEVEL 0	136.4	124.2	6.4	5.8
1.4.3 LEVEL 1	1,515.1	1,120.0	207.7	187.4
1.4.4 LEVEL 2	2,039.8	1,002.3	100.9	936.6
1.4.5 LEVEL 3	1,049.0	813.7	9.3	226.0
1.5 ONLINE EQUIPMENT	746.0	293.4	169.6	283.1
1.5.1 ON-LINE EQUIPMENT	746.0	293.4	169.6	283.1
<hr style="border-top: 1px dashed black;"/>				
3.1 TOTAL SOLENOID PROJECT	5,168.0	4,848.2	37.4	282.4
3.1.1 SOLENOID	5,168.0	4,848.2	37.4	282.4

DEFINITION OF TERMS:

Funds: DØ Upgrade = M&S Equipment Funds; Solenoid = AIP Plant Funds.
 Cost Estimate: Total Project and Sub-Project Budgets without contingency.
 Prior Year Obligations: Obligations for fiscal years '92 through '99 as applicable.
 FY 00 Year-to-Date Obligations: Obligations for fiscal year '00.
 Project Balance: Cost Estimate - (Prior Year Obligations + Fiscal 00 YTD Obligations)
 DØ FY 00 Plan: The M&S funds allocated to the Project/Sub-Projects as extracted from the current schedule.
 DØ FY 00 Balance: DØ FY 00 Plan - FY 00 Year-to-Date Obligations

DØ Upgrade Monthly Progress Report

for the month of May, 2000



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
YTD ACTUAL	962.6	1,199.8	1,664.6	2,169.3	2,546.1	2,855.8	3,077.4	3,623.2				
YTD PLAN	962.6	1,199.8	1,664.6	2,169.3	2,546.1	2,855.8	3,077.4	3,421.4	4,141.4	4,975.4	5,555.4	5,775.4

DØ Upgrade Monthly Progress Report

for the month of May, 2000

Active MOUs as of 5/31/00

<u>INSTITUTION</u>	<u>EQUIPMENT</u>	<u>R&D</u>	<u>COSTED</u>
Boston University	298,200	5,200	35,093
Brookhaven National Laboratory	236,439		181,247
Brown University	820,076	106,000	161,319
California State University, Fresno	26,160		4,083
Columbia University, Nevis Labs	140,000		107,937
DAPNIA / Saclay	0	0	0
IN2P3	0	0	0
Indiana University	65,000		31,585
Institute for High Energy Physics (IHEP)	270,433		107,838
Kansas State University	113,300	92,512	107,789
Louisiana Tech University	80,854		56,917
Michigan State University	226,087		68,744
Moscow State University	23,250		0
NIKHEF / Amsterdam	0	0	0
Northern Illinois University	133,000	28,000	130,872
SUNY at Stony Brook	1,105,750	20,000	490,133
University of Arizona	820,598	78,100	474,299
University of Calif, Davis		9,720	0
University of IL, Chicago	129,103	22,000	91,042
University of Kansas, Center for Research, Inc.	16,000		1,889
University of Maryland	0		0
University of Nebraska, Lincoln	0		0
University of Notre Dame	190,500	77,000	102,097
University of Oklahoma	43,000		33,210
University of Texas, Arlington	126,764		116,623
<u>University of Washington</u>	<u>50,640</u>	<u>5,250</u>	<u>38,538</u>
Total Fermilab Funds:	<u>\$4,915,154</u>	<u>\$443,782</u>	
Total Costed:	2,112,677	228,577	<u>\$2,341,254</u>
Total Open Commitments:	<u>\$2,802,477</u>	<u>\$215,205</u>	

DØ Upgrade Monthly Progress Report

for the month of May, 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
	F Wedge Assemblies 80% Complete	Silicon Tracker	6/20/00	4/26/00	7.6 w
	9 Chip Ladder Fabrication 80% Complete	Silicon Tracker	6/27/00	3/27/00	13 w
	SFE, SRC Fabrication Complete	Muon Electronics	6/27/00	2/3/00	20.5 w
	M2-First Silicon Tracker Barrel/Disk Module Complete	Silicon Tracker	6/28/00	1/24/00	22.2 w
	M3-L3 Operational (One Full Chain)	Trigger	6/29/00	6/1/00	4 w
	MBTs Received	Trigger	6/30/00	3/16/00	15 w
	Ten 8-chip Analog Boards Available	Fiber Electronics	7/11/00	4/19/00	11.4 w
	Waveguide Production 50% Complete	Fiber Tracker	7/12/00	1/29/00	23.1 w
	6 Chip Ladder Fabrication 80% Complete	Silicon Tracker	7/12/00	3/14/00	16.8 w
	Preproduction MTCxx, MTFB, and MTCM Complete	Trigger	7/12/00	1/24/00	24 w
	10 Digital Boards Available	Fiber Electronics	7/13/00	3/22/00	15.7 w

DØ Upgrade Monthly Progress Report

for the month of May, 2000

M2-Calorimeter Preamp System Test Complete	Calorimeter Electronics	7/13/00	3/31/00	14.4 w
M3-VLPC Cryo System Operational	VLPCs	7/18/00	6/12/00	5 w
M3-Calorimeter CC,ECN Preamp Installation Complete	Calorimeter Electronics	7/20/00	3/31/00	15.4 w
M2-Muon End Toroids Installed on Platform	Master	7/25/00	11/15/00	-15.8 w
South H-Disks Ready to Move to DAB	Silicon Tracker	8/4/00	7/3/00	4.6 w
South Half-Cylinder Complete and Ready to Move to DAB	Silicon Tracker	8/10/00	8/1/00	1.6 w
M3- Cal Readout Available to L2	Trigger	8/15/00	2/11/00	26 w
M3-Waveguide Production Complete	Fiber Tracker	8/16/00	6/5/00	10.4 w
M3-VLPC Cassette Assembly 50% Complete	VLPCs	8/17/00	4/12/00	17.8 w
Multichip Modules Received	Fiber Electronics	8/25/00	2/23/00	26 w
Drawers Ready	Intercryostat Detector	8/25/00	12/14/99	34.2 w
B-Layer Octants Assembled	Muon Forward Tracker	9/1/00	4/18/00	19.2 w
All MDT Octants Assembled	Muon Forward Tracker	9/1/00	7/14/00	7 w
MRC, MFC Production Complete	Muon Electronics	9/1/00	3/27/00	22.4 w
Global Installation Complete	Trigger	9/7/00	7/12/00	8 w
L2 Cal Installation Complete	Trigger	9/7/00	8/21/00	2.4 w
L2 CTT Installation Complete	Trigger	9/7/00	8/9/00	4 w
Timing System Installed	Calorimeter Electronics	9/18/00	8/18/00	4 w
Production MTCxx, MTFB, and MTCM Complete	Trigger	9/21/00	6/27/00	12 w
L2 Muon Installation Complete	Trigger	9/21/00	7/26/00	8 w
Daughterboard Vendor Production Complete	Calorimeter Electronics	10/4/00	6/16/00	15.2 w
M3-VLPC Cassette Assembly Complete	VLPCs	10/13/00	8/22/00	7.4 w
PDT Commissioning Complete	Muon Central	10/17/00	6/9/00	18 w
M3-Muon Level 1 Trigger Preproduction Testing Complete	Trigger	10/20/00	4/18/00	26 w
M3-All Silicon Tracker Barrels/Disks Complete	Silicon Tracker	10/27/00	8/25/00	9 w
North Half-Cylinder Complete and Ready to Move to DAB	Silicon Tracker	10/27/00	9/18/00	6 w
M1-Central Silicon Complete	Silicon Tracker	10/27/00	9/18/00	6 w
Mixer Boards Ready	Fiber Electronics	11/10/00	6/22/00	19.8 w
M1-Begin Shield Wall Removal/Ready to Roll-in	Master	11/13/00	11/22/00	-1.4 w
BLS Motherboard Assembly Complete	Calorimeter Electronics	11/22/00	8/7/00	15.2 w
CFA Commissioning Complete	Muon Central	11/22/00	7/10/00	19.3 w
Muon Forward Tracker B-Layer Planes Installed	Muon Forward Tracker	11/30/00	6/15/00	23.2 w
All MDT Planes Installed	Muon Forward Tracker	11/30/00	8/4/00	16.2 w
M2-Silicon Tracker Installed in Solenoid/Fiber Tracker	Silicon Tracker	12/15/00	9/25/00	11.6 w
Alpha Cards Received	Trigger	12/18/00	5/15/00	30 w
M2-Calorimeter BLS Assembly Complete	Calorimeter Electronics	1/8/01	9/26/00	13.6 w
All Muon Forward Trigger Detector Planes Installed	Muon Forward Trigger	1/9/01	8/25/00	18 w
M3-Trigger Level 2 Commissioned	Trigger	2/2/01	9/21/00	18 w
M1-Detector Rolled-in and Hooked Up	Master	2/16/01	2/2/01	2 w