



DAQ Review Summary and Rebaseline Proposal

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Status and Plans

- Status of the project
 - Internal review meetings were held in October
 - We heard from leaders of each subproject
 - All are committed to moving ahead with their projects
 - The group is committed to being ready for a summer 2005 installation
- Rebaseline proposal
 - A draft Baseline Change Proposal was submitted
 - We propose a reduction DOE MIE from \$25.0M → \$9.3M



The New Schedule Challenge

Draft Multi-Year Fermilab Schedule

Year		2003	2004	2005	2006	2007
Tevatron Collider		CDF & DZero	CDF & DZero	CDF & DZero	CDF & DZero	BTeV
		CDF & DZero				
Neutrino Program	B	MiniBooNE	MiniBooNE	M&D	OPEN	OPEN
	MI			MINOS	MINOS	MINOS
Meson 120	MT	Test Beams				
	MC	E907/MIPP	E907/MIPP	E907/MIPP	OPEN	OPEN

This draft schedule is meant to show the general outline of the Fermilab accelerator and experiments schedules.

Major components include:

5-6 week shutdown each summer

5-6 month shutdown for the installation of CDF and DZero detector upgrades in 2006-7

Startup of the NuMI operation with the MINOS detector

added, typically allowing 4.0 years of accelerator operation per year .
 (more precise information is made available .

Can we be ready here?

- RUN or DATA
- STARTUP/COMMISSIONING
- INSTALLATION
- M&D (SHUTDOWN)

How about here?



DAQ Review 13 Oct.

- Agenda

- Background Comments - Pat Lukens
- Event Builder and Level 3 Plans - Bruce Knuteson
- Pulsar Project Status and Production Readiness - Ted Liu
- Silicon DAQ Upgrade - Petar Maksimovic
- SVT Upgrade path - Allesandro Cerri
- The Baseline Plans - Kevin Pitts
- Read out upgrades and the replacement design - Ting Miao
- Recent Developments with the Michigan TDCs - Ron Moore
- Prospects for the Michigan TDCs - Myron Campbell
- XFT Upgrade Status and Plans - Richard Hughes/Kevin Pitts



DAQ Review

- The review was well attended – full agenda of speakers
- A review committee heard the plans
 - F. Chlebana, J. Patrick, E. James, J. Lewis
- Committee report was favorable
- The motivation is still strong – some good technical insight came from the review process.



DAQ Review Summary

- Event Builder
 - MIT group has been busy recently developing the project.
 - A new technical solution is planned – Gigabit ethernet
 - Reviewers strongly encourage this approach
 - New cost/schedule being developed
- Level 2 Decision Crate
 - Good progress here with the Pulsar boards
 - Production readiness review is scheduled



DAQ Review Summary

- Silicon DAQ Upgrade
 - Ideas, issues were presented here
 - Many questions about the need and exact plan remain.
 - This requires more development before we can proceed.
- SVT upgrade
 - An upgrade of the associative memories is planned/funded by INFN. Provides more patterns – finer roads



DAQ Review Summary

- TDCs

- Baseline plan has a new TDC and a Data Concentrator to read the data from the crate.
- The Data Concentrator has been dropped by the proponents in favor of a commercial solution – VME to PCI bus interface
- The review committee preferred a different commercial solution – VME to Gigabit Ethernet. This has already been investigated and looks promising.



DAQ Review Summary

- The existing TDCs
 - We heard two talks on the current TDCs
 - An improvement to the “on board” code was discussed that may give readout speeds of 500 Hz
 - A proposal to add a mezzanine card to the boards to provide alternative readout was presented
 - These ideas are good, but the baseline plan will not change
 - Many elements of risk exist in the alternates
- The replacement of the TDCs shall remain our baseline approach.



DAQ Review Summary

- XFT (Track Trigger Upgrade)
 - Both groups working here (OSU and UI) have recently hired postdocs who have begun work on XFT
 - This has been falling behind, but a lot has been done since the hirings, and prospects are encouraging here.
 - Work towards better understanding of future trigger rates was shown – this guides the design.



Review Conclusions

- We conclude
 - There is a commitment to see all the projects through
 - Installation by 2005 was encouraged by the reviewers, accepted by the subproject leaders
 - TDCs and XFT are probably challenged most here
 - There are areas where the technical direction needs work
 - Silicon related DAQ needs development
 - There are no new projects being proposed. We think the scope of the nonsilicon projects is right.
- The baseline of the nonsilicon upgrades will not change.



New Baseline

- Our new baseline is simply described:
- We will drop all tasks required for the construction of the new silicon detector
- We will retain four tasks at level 4 in the WBS needed to maintain the current detector or ensure that it will read out at high luminosity
- Retained tasks:
 - 1.1.2.9, 1.1.2.10 – High level data acquisition upgrades
 - 1.1.4.3, 1.1.4.5 – Radiation monitoring and safety interlock maintenance.



Rebaselined Cost Estimate

	Baseline (\$K)		New Scope (\$K)	
	Cost	Cont.*	Cost	Cont.
Silicon	\$ 12,008	\$ 5,145	\$ 854	\$ 396
Calorimeter	\$ 342	\$ 335	\$ 342	\$ 381
DAQ	\$ 3,788	\$ 1,678	\$ 3,788	\$ 1,678
Admin.	\$ 1,285	\$ 407	\$ 1,285	\$ 407
Total	\$ 17,422	\$ 7,565	\$ 6,269	\$ 2,862

- Contingency per subproject is from 2002 low level estimate –
*scaled by use to date
 - \$46K added to calorimeter for phototubes in JY04
- New DOE MIE total cost drops - \$24,987K → \$9,131K
 - All costs shown here are total, in current year \$K



Funding Plan

	Funds in Current Year \$K				
	FY02	FY03	FY04	FY05	Total
DOE MIE	\$ 3,460	\$ 3,509	\$ 1,000	\$ 1,162	\$ 9,131
DOE R&D	\$ 1,670	\$ 480	\$ 1,987		\$ 4,137
Foreign Contributions	\$ 40	\$ 342	\$ 252	\$ 10	\$ 644
U.S. Universities	\$ 24	\$ 225	\$ 103	\$ 26	\$ 378
Total	\$ 5,194	\$ 4,556	\$ 3,342	\$ 1,198	\$ 14,290

- Future DOE MIE funding is modest
- Prior year funding will cover our needs well into the project
 - Completely, if no contingency is used.



Rebaselined Schedule

- The silicon detector set our critical path.
- Other projects planned on being ready for the silicon installation period.
- Now we are thinking around the accelerator maintenance shutdowns, and installing with the minimum downtime.
- All projects will target the summer 2005 shutdown
 - EM Timing will be 2004, some prep work on CPR also
- Only silicon milestone changes planned at this time



Silicon Costs

- There are several sources of cost that goes into the plan for closing the silicon
 - Obligations on equipment codes made in FY03
 - Obligations on R&D codes in September 03
 - A credit, due to cancellation of the sensor order
 - The resource loaded closeout schedule
 - This has recently been discovered to be flawed
 - Some items double counted, so it represents an upper limit
- Identification of the R&D funds to cover these costs is part of the rebaseline proposal.



Silicon Closeout Costs

	Costs (\$K)
Equip. Obligations in FY03	\$ 1,452
R&D Obligations in Sep 03	\$ 170
Overhead on " "	\$ 45
Sensor Order Cancellation	\$ (622)
Closeout Schedule estimate (upper limit)	\$ 628
Contingency on above	\$ 314
Total	\$ 1,987

- Closeout schedule breakout:

- *More work is needed on this
- Probably some M&S overcounting

	Costs (\$K)
M&S*	\$ 209
Labor	\$ 296
G&A	\$ 123
Total	\$ 628



Conclusions

- CDF is committed to completion of the remaining scope of the project
- Silicon construction cancellation motivates
 - Increased contingency on the purchase of phototubes
 - This is an “In Kind” purchase by Japan – now threatened
 - New installation strategy for the preshower upgrade
 - New installation schedule for all projects
- We propose a new baseline for the DOE MIE of \$9.1M (46% cont.).