



Run IIb DZero PMG March '03 Reporting Period

- Overview, issues (Kotcher)
- Schedule & COBRA status (Freeman)
- AOB

Jon Kotcher
Fermilab PMG
May 6, 2003



Run IIb Project Organization

DO Run IIb Project
J. Kotcher, Project Manager
 R. Partridge, Deputy; V. O'Dell, Associate; W. Freeman, Assistant
 M. Johnson, Technical Coordinator
 A. Amorn-Vichet, Budget Officer; T. Erickson, Administration

WBS 1.1
Silicon
 M. Demarteau
 G. Ginther

WBS 1.2
Trigger
 P. Padley
 D. Wood

WBS 1.3
DAQ/Online
 S. Fuess
 P. Slattery

WBS 1.4
Project
Administration

WBS 1.5
Installation
 R. Smith

1.1.1 Sensors
 R. Demina, F. Lehner

1.1.2 Readout System
 A. Nomerotski, E. von Toerne

1.1.3, 1.1.5 Mechanics & Assembly
 W. Cooper, K. Krempetz

1.1.4 Production
 J. Fast

1.1.4 QA, Testing, & Burn-in
 C. Gerber

1.1.6 Monitoring
 M. Corcoran, S. de Jong

1.1.7 Software & Simulation
 F. Rizatdinova, L. Shabalina

1.1.8 Administration
 (M. Demarteau)

1.2.1 L1 Cal Upgrade
 M. Abolins, (H. Evans),
 P. LeDu

1.2.2 L1 Cal/Track Match
 K. Johns

1.2.3 L1 Track Trigger
 M. Narain

1.2.4 L2β Upgrade
 R. Hirosky

1.2.5 Silicon Track Trigger
 U. Heintz

1.2.6 Simulation
 M. Hildreth, E. Perez

1.2.7 Administration
 (D. Wood)

1.3.1 Level 3 Systems
 D. Chapin, G. Watts

1.3.2 Network & Host
 Systems
 J. Fitzmaurice,
 S. Krzywdzinski

1.3.3 Control Systems
 F. Bartlett, G. Savage,
 V. Sirotenko

1.3.4 DAQ/Online
 Management
 (P. Slattery)

1.5.1 Silicon Installation
 Mechanical:
 H. Lubatti
 Electronics:
 L. Bagby, R. Sidwell

1.5.2 Trigger Installation
 D. Edmunds

**Paul Padley (Rice U.) is new
 trigger co-leader**



Manpower Issues

- Paul Padley replaces Hal Evans, joining Darien Wood as WBS Level 2 Trigger Manager
 - ◆ Significant addition, much experience in board design, fabrication
 - ◆ Hal remains on as critical principal in Level 1 Calorimeter Trigger effort (WBS Level 3)
- Integration of Cecil Needles (electrical technician) into Project not as smooth as it should have been
 - ◆ Fought hard to get him in Dec/Jan, PPD responded promptly
 - ◆ Despite our taking these moves quite seriously, we did not adequately oversee his initial integration at SiDet
 - ◆ Problem addressed, he is now fully engaged
 - ◆ Awkward problem - my apologies for this
- Managerial load requires more DC depth in Project Office
 - ◆ Underscored by (temporary) loss of two key personnel (O'Dell, Erickson) during past six weeks
 - ◆ Project tools in development have required tending
 - ◆ A number of things falling behind
 - ◆ Considering options from both Laboratory and Collaboration



Manpower Issues

- **Run IIb Commissioning Coordinator**
 - ◆ Constraining duration of shutdown will require very tight choreography, extensive preparation
 - ◆ Outline of initial plan will be presented at DZero Workshop at Beaune in June (Partridge)
 - ◆ Will probably have to come from Collaboration
- **Sorely need additional electronics engineers, experts**
 - ◆ Relying on Mike Utes for too many things for too long
 - ◆ Holds critical items back
 - ◆ Understood that such individuals are not easy to find, but...
 - ◆ Have suggested Paul Rubinov be groomed for the longer term
 - ◆ Long-standing, often discussed need
 - ◆ Will be approached again with PPD



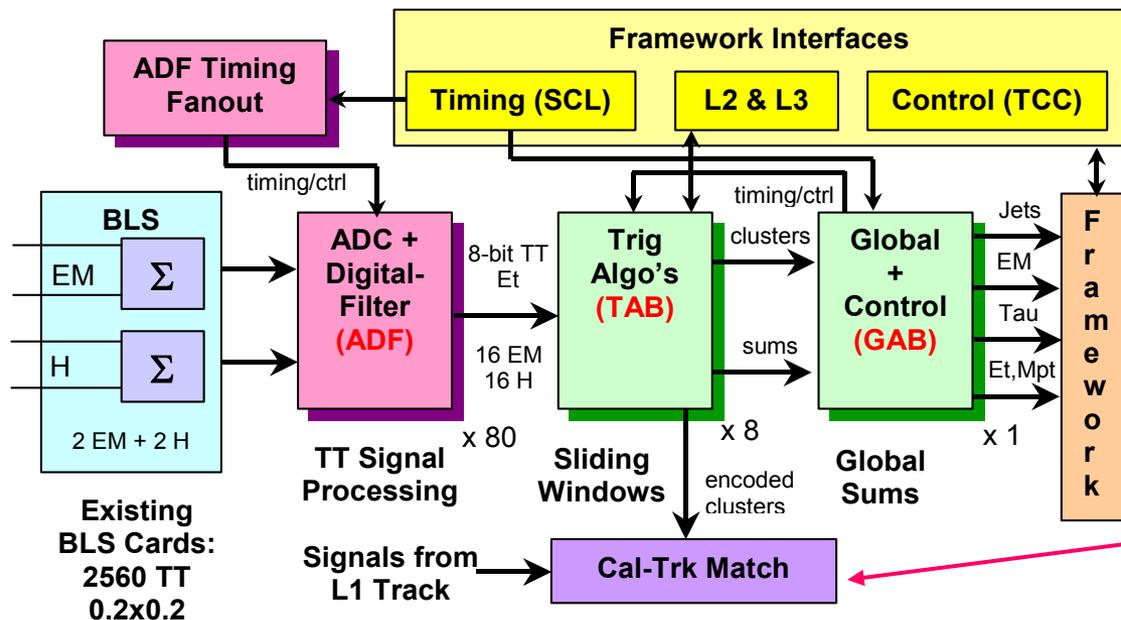
Change Controls

- First formal Director's/DOE L2 change control completed last month
 - ◆ Silicon Module Production Begun (baseline milestone: 5/17/04)
- No additional higher-level change controls this month
- Have implemented internal change control for design change of Global Algorithm Board (GAB) in Level 1 calorimeter trigger
 - ◆ Split-off of Serial Command Link (SCL) and VME functionality to additional board
 - ◆ Minimal impact on schedule, cost (few k\$)
 - ◆ Approved by Project Manager, other principals this month
- Installation of L1 calorimeter prototype elements for in situ integration test still scheduled to begin mid-July
 - ◆ Good progress here, important milestone



WBS 1.2.1: Calorimeter Trigger Upgrade

- **Saclay**
 - ◆ ADC+Digital Filter (ADF)
 - ◆ ADF timing distribution board
 - ◆ Analog splitter (for in-situ tests)
 - ◆ ADF Crate/backplane
- **Nevis**
 - ◆ Trigger algorithm board (TAB)
 - ◆ Global Algorithm Board (GAB)
 - ◆ Crates for TAB/GAB
 - ◆ Test system for ADF-to-GAB cables
- **Michigan State**
 - ◆ Interfacing to existing system, framework
 - ◆ Infrastructure



L1 Cal/Track
Match:
University of
Arizona



Production Readiness Reviews

- Layer 2-5 (Outer Layer) Sensor Production Readiness Review
 - ◆ Held March 6, 2003
 - ◆ Committee:
 - ▲ N. Bacchetta, J. Ellison (Chair), B. Gobbi, R. Lipton, H. Sadrozinski, S. Worm
 - ◆ Favorable, helpful review
- Committee Report:
 - ◆ http://d0server1.fnal.gov/projects/run2b/Management/PRRs/d0si_prr_2003_report.pdf
- Project Responses:
 - ◆ http://d0server1.fnal.gov/projects/run2b/PRR_Response_OL_sensors_042503.doc
- Are preparing for Layer 0 and 1 procurements mid-April (HPK)
 - ◆ Tacked on to existing outer layer order
 - ◆ Radiation testing, flux calculations more exacting here, being completed and documented
 - ◆ Will be reviewed by same committee



Upcoming '03 Production Readiness Reviews

Silicon

Element/System	Scheduled Date ('03)	Comments
L0 & L1 sensors	May 09	In preparation, same Committee as for L2-5
Low voltage system	Jul 08	
Layer 0 & 1 mechanical structures	Jul 08	In preparation
High voltage system	Aug 01	
Stave design	Aug 08	
L0/1/2 hybrids	Aug-Oct	Will be consolidated
Analog cables	Oct 26	
L0/1/2 digital jumper cables	Sep-Oct	Will be consolidated

Trigger

Element/System	Scheduled Date ('03)	Comments
Calorimeter/Track Match design	May 27	In preparation
Trigger Algorithm Board (TAB) design	Jul 19	Will be consolidated, as appropriate
Global Algorithm Board (GAB) design	Oct 09	
ADC-Digital Filter (ADF) design	Oct 30	

Varying levels of rigor required - still, schedule is dense



Procurement

- Orders for SVX4 (TSMC - on track for May 13 delivery), outer layer sensors (Hamatsu) are out
- Collaboration between FNAL Procurement, DOE FAO, and DOE CH was critical in achieving this in a timely way (our thanks)
- Three elements remain that will likely be foreign & sole-sourced:

Item	Company	Anticipated Procurement Date	Amount (FY02 k\$)	Comments, status
LO & L1 sensors	Hamamatsu (Japan)	Apr '03	310	Will be tacked on to outer layer sensor order; Buy America justification already addressed there
Analog cables	Dyconex (Swiss)	Sep '03	167	In internal preparation
Low Voltage Power Supplies	Wiener (Germany)	Fall '03	40	Below \$100k threshold for DOE FAO sign-off
TOTAL			517	

- All are silicon orders - nothing in this category for trigger, online
- Other orders continue to proceed without difficulty - expedited by Project Office



Schedule Status

(details in talk from Freeman)

- Project held well to its schedule during last month
- Progress good on all fronts:
 - ◆ Board layout, firmware development, electronics, hybrids, mechanical, fixturing, cables, sensors,...

L2/Director's Milestones vs Current Forecast						
(Sorted by L2/Director's Baseline Date)						
Milestone Description	L2/Director's Baseline (3/03)	Last Month's Forecast (2/03)	This Month's Forecast (3/03)	L2/Director's Variance (work days)	Monthly Variance (work days)	Notes
WBS 1.1 Silicon Tracker						
Silicon Prototype Mechanical Stave Built	01/06/03	12/18/02	12/18/02	(6)	0	Complete
L2-L5 Silicon Sensors Released For Production	03/24/03	04/01/03	04/01/03	6	0	
SVX4 Released For Production	10/20/03	09/19/03	09/25/03	(17)	4	
Successful Readout Of Full Silicon Stave	01/29/04	10/17/03	10/17/03	(64)	0	
Silicon Module Production Begun	07/15/04	05/17/04	05/21/04	(37)	4	
All Silicon Sensors Delivered And Tested	12/09/04	09/08/04	09/08/04	(64)	0	
All SVX4 Chips Produced And Tested	12/21/04	08/03/04	08/09/04	(93)	4	
All Silicon Hybrids Produced And Tested	03/03/05	11/09/04	11/15/04	(68)	4	
Silicon Stave Production Begun	03/08/05	11/22/04	11/30/04	(62)	4	
Silicon Module Production And Testing Complete	07/22/05	03/22/05	03/28/05	(82)	4	
Downstream Silicon Readout Ready for Installation On Platform	10/25/05	05/18/05	05/24/05	(107)	4	
Silicon Stave Production Complete	12/22/05	07/26/05	08/01/05	(100)	4	
South Silicon Complete	02/10/06	08/25/05	08/31/05	(106)	4	
North Silicon Complete	05/04/06	11/02/05	11/08/05	(117)	4	
Silicon Ready To Move To DAB	05/25/06	11/21/05	11/29/05	(119)	4	
WBS 1.2 Trigger						
L1 Trigger Cal-Trk Match Production and Testing Completed	09/23/04	08/12/04	08/12/04	(29)	0	UArizona MoU/SoW (now complete)
L2 Silicon Track Trigger Production and Testing Complete	10/17/05	12/08/04	12/08/04	(212)	0	
L1 Calorimeter Trigger Production And Testing Complete	01/05/06	03/28/05	04/11/05	(181)	10	
L2 Beta Trigger Production And Testing Complete	01/05/06	02/28/05	02/28/05	(211)	0	
L2 Trigger Upgrade Production and Testing Complete	01/05/06	02/28/05	02/28/05	(211)	0	
L1 Central Track Trigger Production And Testing Complete	01/10/06	03/10/05	03/10/05	(206)	0	
L1 Trigger Upgrade Production and Testing Complete	01/10/06	03/28/05	04/11/05	(184)	10	
WBS 1.3 Online/DAQ						
Online System Production and Testing Complete	10/07/05	06/17/05	06/17/05	(78)	0	

SVX4 slippage since Feb

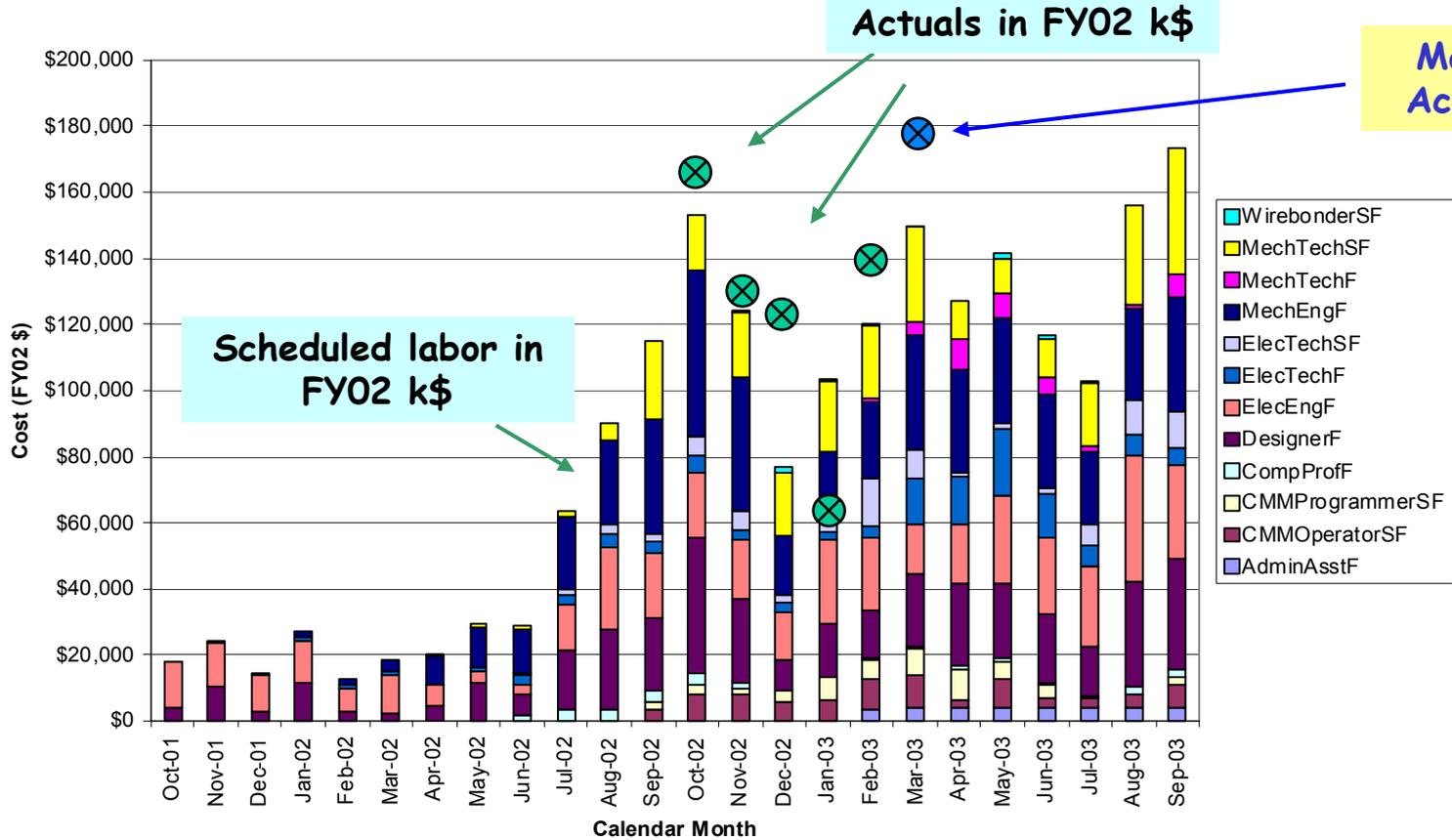
UArizona MoU/SoW (now complete)



Labor Cost Extracted from Schedule vs. Actuals

Through Mar '03

FNAL Technical Labor
All Funding Sources
FY02 & FY03



Numbers shown include EQ + R&D
More detailed labor breakdown at next PMG



COBRA Status

- Four primary issues that need to be dealt with before signing off:
 - ◆ Errors occur when downloading % completes from silicon files
 - ▲ WELCOM patch exists, being discussed, will be implemented
 - ◆ Program has shown instabilities
 - ▲ Multiple running of same files have given different results
 - ▲ Believe we have a handle on this
 - ◆ Proper verification of all inputs (schedule, labor, burdening, actuals, etc.)
 - ▲ Much of this has been done, but some work remains
 - ◆ Calculation of Latest Revised Estimate (LRE), variance
 - ▲ Despite WELCOM's most recent explanation, this still does not yet appear to make sense
- COBRA is non-trivial to run and understand
- Large investment from Amorn-Vichet, Freeman, Hoffer, and PPD (Arroyo) in recent weeks to make this work reliably (my thanks)
- We want to make sure that the project is "graded" on data that accurately reflects our cost and schedule status



Conclusions

- Schedule in good shape this reporting period
- Money is not an issue for us at this time
 - ◆ Rarefied and privileged state in this climate - it is much appreciated
- Technical progress remains quite good, strong team - problems are not trivial, but have encountered nothing lethal
- Managerial load is huge, still not satisfied we've matched it with adequate staffing level
- Labor needs are being sharpened, a few formal requests to Laboratory are forthcoming
- I would like to see a system administrator, or other Lab-wide expert, assigned to supporting COBRA