



DZero Run IIb Baseline Change Proposal

- ◆ Elements of the BCP
 - ▲ Silicon Cancellation/Closeout
 - ▲ Silicon Layer 0
 - ▲ Trigger upgrade
 - ▲ DAQ/Online upgrade
 - ▲ Project Admin

- ◆ Putting it all together
 - ▲ Total baseline costs & changes

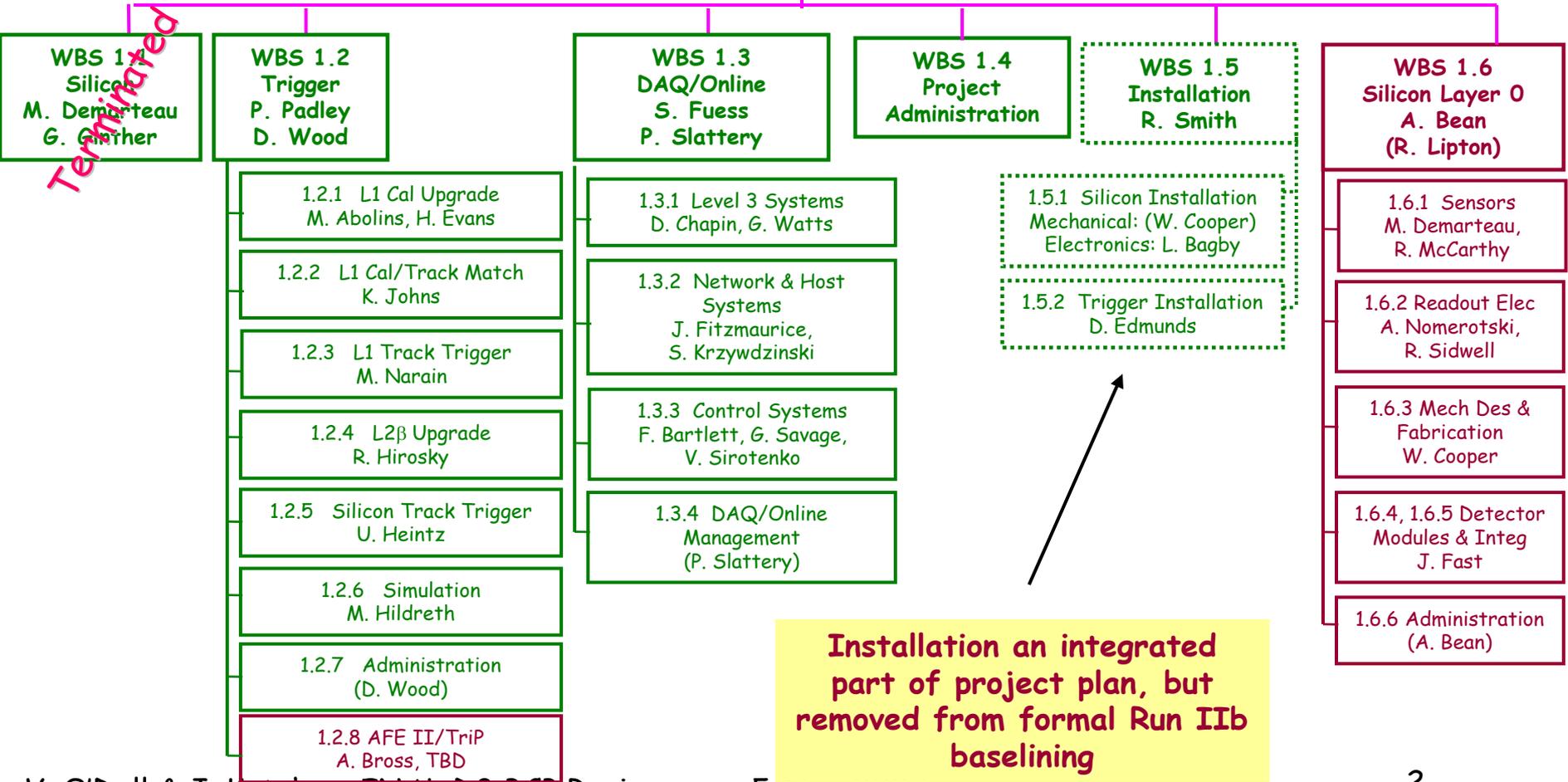
V. O'Dell, J. Kotcher
Run IIb Upgrade Rebaselining Review
Fermilab
November 5, 2003



Run IIb Project Organization

Nov '03

DO Run IIb Project
 J. Kotcher, Project Manager
 V. O'Dell, Deputy (Trigger/DAQ); R. Lipton, Deputy (Silicon Layer 0)
 W. Freeman, Associate, M. Johnson, Technical Coordinator
 D. Knapp, Budget Officer; T. Erickson, Administration



Installation an integrated part of project plan, but removed from formal Run IIb baselining



Documentation Provided

- Plenary presentations
- Two presentations on Silicon Layer 0 installation
- Project schedules & milestones
- Basis of Estimate for Silicon Layer 0
- Responses to Oct 14 '03 Review of Layer 0
- Draft Layer 0 Conceptual Design Report
- Silicon Closeout Document
- Cost & Contingency Assessment
- Risk Analysis
- Draft Baseline Change Proposal, Change Controls
- Draft Addendum to Project Management Plan
- Draft Project Execution Plan



General Approach

- The changes to the project reflected in the BCP are only those that result directly from the silicon cancellation
 - ◆ Necessary tracking enhancements, improvements in light of reduced silicon functionality
 - ▲ Silicon Layer 0, AFE II/TriP
 - ◆ Collaborators contributing in kind effort have pulled out as a consequence of this decision
 - ◆ Project Administration needs scaled back to reflect descoping
 - ◆ Final silicon activities, closeout properly accounted for
- These changes are added to the previous baseline of the ongoing projects to arrive at the new TPC, TEC, etc.
- The changes are first signed off on by the Laboratory via Change Requests (see documentation), then integrated into the BCP



1.1 Run IIb Silicon

- ◆ Original Silicon DOE TEC (AY \$K)

WBS #	Base	Contingency	Total
1.1	\$9,976	\$4,581	\$14,557

- ◆ Previously spent (through FY03) \$1,560 on 1.1
- ◆ Additional \$350k for rational closeout (see following slides)
- ◆ These costs are added into R&D
(total of \$1,910)
- ◆ In addition, \$3.9M in R&D already spent on silicon sub-project (see BCP)
- ◆ Total R&D = \$1.9M + \$3.9M = \$5.8M (see BCP)



Silicon Closeout

◆ Three elements to silicon closeout

▲ SiDet General

- Testing outer layer sensors
 - Stopping future visual inspection of sensors
 - Continuing radiation studies
- Testing inner layer sensors

▲ SVX4

- Finish testing preproduction run of SVX4 wafers

▲ DO specific

- Hybrid testing
- Stave testing: mechanical and electrical
- Inner layer structure completion/testing



Silicon Closeout Costs

- ◆ Costs by element for Silicon Closeout (from silicon closeout document):

Fully Burdened FY04 \$

<i>Task</i>	<i>M&S</i>	<i>Labor</i>	<i>Total</i>
Outer Layer Sensors	\$21,245	\$31,281	\$52,526
Inner Layer Sensors		\$2,350	\$2,350
SVX4	\$9,420	\$41,365	\$50,785
Hybrid Testing	\$18,835	\$92,762	\$111,597
Mechanical Grade Staves	\$11,772	\$32,926	\$44,698
Electrical Grade Staves	\$11,632	\$26,600	\$38,232
Inner Layer Support Structure	\$23,544	\$26,600	\$50,144
Total	\$96,448	\$253,884	\$350,332

Total M&S for silicon closeout ~ \$100k



Silicon Layer 0 costs

- Unburdened FY02 \$

	FY 02 \$ no G&A	M&S non-labor	M&S Labor	M&S Cost	Contingency %	M&S Contingency	Total M&S	FNAL Labor	Labor Contingency	Labor Contingency	Total Labor	Total Cost (incl labo	Cost + Contingency
1	Layer 0 Silicon Detector	\$573,805	\$208,379	\$782,184	73%	\$573,426	\$1,355,610	\$535,847	50%	\$267,923	\$803,770	\$1,374,921	\$2,216,270
1.1	Sensors	\$163,000	\$1,200	\$164,200	100%	\$164,200	\$328,400	\$14,940	50%	\$7,470	\$22,410	\$179,140	\$350,810
1.2	Readout Electronics	\$281,708	\$117,840	\$399,548	76%	\$303,461	\$703,009	\$198,629	50%	\$99,314	\$297,943	\$619,577	\$1,022,352
1.3	Mechanical Design and F	\$49,686	\$89,339	\$139,025	50%	\$69,413	\$208,438	\$134,192	50%	\$67,096	\$201,288	\$273,217	\$409,726
1.4	Layer 0 Detector Modules	\$16,711	\$0	\$16,711	75%	\$12,503	\$29,214	\$74,076	50%	\$37,038	\$111,114	\$90,787	\$140,328
1.5	Final Detector Integration	\$25,700	\$0	\$25,700	50%	\$12,850	\$38,550	\$60,202	50%	\$30,101	\$90,303	\$85,902	\$128,853
1.6	Monitoring	\$12,000	\$0	\$12,000	50%	\$6,000	\$18,000	\$0		\$0	\$0	\$12,000	\$18,000
1.7	Software and Simulation	\$0	\$0	\$0		\$0	\$0	\$42,300	50%	\$21,150	\$63,450	\$42,300	\$63,450
1.8	Silicon Project Administra	\$25,000	\$0	\$25,000	20%	\$5,000	\$30,000	\$11,508	50%	\$5,754	\$17,262	\$71,998	\$82,752

- Note that a large part of the M&S costs (~\$650k) are covered through the existing MRI grants for the Run IIb Silicon Upgrade



Trigger/Online

- **Trigger (WBS 1.2)**
 - ◆ Will take a financial hit due to Saclay leaving the project
 - ▲ Passing off L1Cal engineering to UIC/MSU/UVa
 - ▲ Saclay in-kind contribution discontinued beyond FY03
 - ▲ Current estimate: \$475k (unburdened FY02 k\$)
 - ◆ Adding in AFE II/TRiP chip upgrade
- **Online (WBS 1.3)**
 - ◆ Scope/costs have not changed
- **Project Administration (WBS 1.4)**
 - ◆ Silicon descoping reduces demands on budget officer, scheduler officer and administrative assistant
 - ◆ Duty cycle of these support personnel reduced by factor of two for remainder of project
 - ◆ Decreases cost by ~\$700k



AFE II/Trip

- Added as WBS 1.2.8, part of the trigger project
- Cost estimate breakdown:
 - ◆ \$638k M&S + \$470k labor (unburdened FY02\$, no contingency)
 - ▲ Labor represents 1.5 FTE elec engineering, 3.0 FTE elec technicians over FY04 & 05
 - ◆ Base estimate contains \$100k for next Trip submission (timing functionality). If full \$200k is needed, remainder will come out of contingency.
 - ◆ Have applied 35% contingency to M&S, 70% to labor
 - ▲ See Risk, Cost & Contingency documents
 - ◆ TPC = \$2.2M, all DOE MIE
- Managing for project completion July, 2005



Total MIE Rebaseline Costs

Old Project TEC (DOE MIE)

DOE TEC, by subsystem in AYk\$	Total	Cont. only	EQ base	G&A only
Silicon	14557	4581	8155	1821
Trigger	2842	1212	1372	258
DAQ/Online	1393	332	881	181
Project Administration	1829	366	1148	315
TOTAL	20621	6490	11556	2575

Contingency fraction on MIE portion = 46%

New Project TEC (DOE MIE)

DOE TEC, by subsystem in AYk\$	Total	Cont. only	EQ base	G&A only
Silicon	1952	1021	735	196
Trigger	5371	1671	3081	618
DAQ/Online	1389	327	881	181
Project Administration	1151	227	729	195
TOTAL	9862	3247	5427	1189

Contingency fraction on MIE portion = 49%



Total Project Cost

Includes all projects being proposed
in new scope

AY k\$	Base	Cont %	Cont	Total
Silicon	1618	63	1021	2638
Trigger	5205	32	1671	6877
Online	1062	31	327	1389
Administrative	924	25	227	1151
TOTAL PROJECT COST	8809	37	3247	12055

All costs (in kind, DOE MIE, M&S and labor)
included, fully burdened, AY k\$



Total Obligation Profile

For projects included in new scope

<i>TPC, Obligation Profile In AY k\$</i>	FY01	FY02	FY03	FY04	FY05	FY06	TOTAL
Silicon (incl. Cont + G&A)	0	0	0	2224	414	0	2638
Trigger (incl. Cont + G&A)	0	468	948	2058	3316	62	6851
Online (incl. Cont + G&A)	0	0	64	412	506	407	1389
Administration (incl. Cont + G&A)	0	0	274	294	304	280	1151
Total Project	0	468	1286	4987	4539	749	12029
R&D (incl. Cont + G&A)	0	0	26	0	0	0	26
Total Project Cost	0	468	1312	4987	4539	749	12055
DOE M&S	0	0	478	2359	2192	373	5402
DOE SWF	0	0	210	1418	1369	275	3271
DOE G&A	0	0	145	466	478	101	1189
TOTAL DOE EQ	0	0	832	4242	4039	749	9862
DOE M&S R&D	0	0	22	0	0	0	22
DOE SWF R&D	0	0	0	0	0	0	0
DOE G&A R&D	0	0	4	0	0	0	4
TOTAL DOE R&D	0	0	26	0	0	0	26
In Kind - Foreign	0	258	202	0	0	0	460
In Kind - MRI silicon	0	0	0	663	24	0	686
In Kind - MRI trigger	0	0	113	57	430	0	599
In Kind - US base	0	210	140	25	46	0	422
Total In-Kind contributions	0	468	454	745	500	0	2167
Forward Funding			0			0	
Total Project Cost	0	468	1312	4987	4539	749	12055



Cost Changes from Oct 03 Draft BCP

		Prior FY	FY04	FY05	FY06	Total
Baseline (\$M)	MIE	6.2	8.6	5.8	0.0	20.6
	R&D	3.9	0.0	0.0	0.0	3.9
	Total DOE	10.1	8.6	5.8	0.0	24.5
Proposed (\$M)	MIE	6.2	1.0	2.7	0.0	9.9
	R&D	3.9	1.9	0.0	0.0	5.8
	Total DOE	10.1	2.9	2.7	0.0	15.7
Change (\$M)	MIE	-	-7.6	-3.1	0.0	-10.7
	R&D	-	1.9	0.0	0.0	1.9
	Total DOE	-	-5.7	-3.1	0.0	-8.8



Changes to DOE Level 1 Milestones

Milestone #	Description	Comments
D-Zero 1.1	All Silicon Sensors Delivered and Tested	Dropped
D-Zero 1.2	Online System Production and Testing Complete	Date unchanged (10/06)
D-Zero 1.3	Silicon Stave Production and Testing Complete	Dropped
D-Zero 1.4	Level 2 Trigger Production and Testing Complete	Date unchanged (01/06)
D-Zero 1.5	Level 1 Trigger Production and Testing Complete	12 weeks added for AFE II/TriP (now 4/06)
D-Zero 1.6	Silicon Ready to move to DAB	Date unchanged, accommodates silicon layer 0



Conclusions

- Project presented here represents full scope for rebaselined Run IIb DZero Detector Project
- DOE MIE = \$9.9M, includes 49% contingency
- New TPC = \$12.1M
- Draft BCP submitted to DOE October 31, 2003
- Numbers being finalized for submission later this month, preparation for November 21 ESAAB