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# Run II Upgrades Status August Report

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# Outline

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- Highlights from the Mini-review
- Management Update
- Technical Highlights
- Status Report for August (v3)
  - Milestones
  - % Complete
  - M&S Costs
  - Effort Report
- Other

# Highlights from the Mini Review

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- Closeout Remarks from the Committee
  - Impressive progress in Run II
  - Good Progress on the technical plan
  - Good Progress in responding to recommendations
  - The high luminosity has resulted from a number of improvements to (and imaginative solutions in) the existing facility and its operations, but not yet from pbar stacking rate.
  - Look forward to your capitalizing on the impressive improvements in instrumentation and understanding of performance limitations in pbar stacking, and finding aperture restrictions to yield higher pbar stacking rates.
  - Recommendations/Concerns:
    - Machine study time for various projects
    - Beam-beam effects in Tevatron at full Run II intensities

## Highlights from the Mini Review (Contd.)

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- Remarks on Management
  - Lab management giving appropriate priority to Run II activities
  - Run II activities appear to be well coordinated across the Lab
  - Committee encourages the continued use of technical peer reviews
  - The new luminosity projections appear reasonable.

# Management Update

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- v3 Plan used for the mini-review
  - Change requests from v2->v3 complete
- WBS Hierarchy changes done
  - More granularity in cost accounting
    - Across divisions, cost types, lower wbs levels in some cases
  - Will help use Cobra interface to the accounting system
    - Extraction of cost information to become transparent (Dixon Bogert, Ann Nestander)
    - Expect to have accounting reports from the new system next month.
- New cost codes
  - Now in use; transfers from old to new codes 95% complete, expect ~100% complete by the end of September
- Jeff Sims is working on improved cost and FTE reporting.

# Technical Highlights / Shutdown Progress

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- Main Injector
  - Slip-stacking/ Beam-loading Compensation
    - Work on remaining 6 stations expected to complete mid-October; Work on the 19<sup>th</sup> cavity in the Booster has priority, for now.
- Recycler
  - Good progress overall
    - Flying wire (95% complete), stochastic cooling (40%), shielding (95%), LEP correction element replacement (20% → reworked magnets to arrive this week), vacuum system rework around e-cool area (50%)
- e-cooling Installation
  - On track for 13 week shutdown; Pelletron installation ahead of schedule
    - MI Bus and LCW piping relocated; cable pulls to MI-31 done
    - Significant progress made in installing Transfer line stands, magnets, alignment and utility work.
    - Work on Pelletron assembly continues.

Done

Dates	Driving Items	Duration	Parallel Work	Dates
(8/23-8/27)	Modify LCW Headers	1-week	*Stake out RR Tunnel Locations Move LEB magnets	(8/24-8/26) (8/24-8/30)
			*Remove Septum MI-30 Modify Gate	(8/24-8/30) (8/24-9/6)
			Remove Transfer Shield Blocks Remove Shielding Plugs Stake out Transferline	(8/24-8/26) (8/26-8/30) (8/26-9/2)
(8/30-9/10)	*Modify Bus	2-weeks	Move BPM's *Rotate MI Ion Pumps	(8/30-9/3) (8/30-9/1)
			Alignment Tie-in Thru Shielding Install/Align Vac. Spool in TL	(8/31-9/2) (9/2-9/6)
			Fill Shielding w/Beads Hand Stack Last Block Build Cave	(9/6-9/8) (9/8-9/10) (9/10-9/14)
(9/13-10/1)	*Pull Cables	3-weeks	Pull Cables in Transferline Install Transferline Gate/Interlock	(9/10-9/17) (9/15-9/21)
			Install Transferline Stands Install Transferline Magnets	(9/15-9/21) (9/22-9/28)
			Align Transferline Remove RR Beamtube Install Magnetic Shielding Around	(9/29-10/1) (9/13-9/15) (9/13-10/1)
			Modify RR Quad Stand	(9/15-9/22)
(10/4-10/11)	Install Solenoids (Cooling)	1-week	Install Transferline Vac. System *Install Cooling Stands *Install Return Line Stands	(9/29-10/12) (10/4-10/8) (10/4-10/8)
(10/12-10/18)	Install Magnets (Return L)	1-week	Terminate Transferline Cables Install Vac. System Cooling/Ret.	(10/13-10/19) (10/12-10/25)
(10/19-11/1)	Terminate Cables	2-weeks	Install Vac. System Cooling/Ret. Align Cooling & Return Lines Install Magnetic Measurement Install Magnetic Shielding	(10/12-10/25) (10/19-10/25) (10/19-10/20) (10/26-11/4)
(11/2-11/15)	Magnetic Measurements	2-weeks		
(11/16-11/17)	Pump Down Vacuum	0.5-week		
(11/17-11/24)	Leak Check	1-week		
(11/24-12/1)	Bake Vac. System	1-week		
Total: 14.5-weeks			<b>Now down to 13 weeks</b>	

\* - Tasks that can possibly be shortened or done in short accesses prior to Shutdown

# e-cool Installation

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# Technical Highlights / Shutdown Progress (contd.)

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- Tevatron:

- BPMs

- EchoTek board approved for production
- Delivery to start next week; 25 boards/week!
- Cable work 95% complete; service building prep in progress

- Separators

- 2 separators at D17 Installed; vacuum leak fixed; need re-alignment, baking next week. Controls and new polarity switches installation in progress.

- Tev Alignment

- Magnet roll measurements done. Unrolls proceeding.
- Dipole reshimming ahead of schedule, but more being added
- Kaiser coil measurements done
- Vacuum upgrades at A0, D0 on schedule.

- IPM/OTR

- Schedule tight for both, but still expecting to install this shutdown

# Technical Highlights / Shutdown Progress (contd.)

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- Antiproton Source
  - DB motorized quad stands (20)
    - Good progress on installing and aligning
      - 10 installed, 8 aligned
  - DB injection region
    - DRF2 move completed
    - LQB installed, aligned, new pipe to be installed this week
    - Re-worked Septum → pulse-tested, will be installed after LQB work
    - Motorized kicker stand: in progress
    - 1-2 weeks behind schedule due to beam pipe troubles; expect to be done in October.
  - Survey of AP1, AP2 lines on schedule
    - AP1 complete, starting AP2
  - Installing ramping cards in AP1

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# Status



# Class B & C Milestones

WBS	Name	MS Class	Finish	Base Fin	2005			
					Qtr 2	Qtr 3	Qtr 4	Qtr 1
1.3.4.3.17	Recycler commissioned for Electron cooling	A	6/1/04	6/1/04	■	6/1		
1.1.1.2.1.23	Slip Stacking HLRF order deliveries 50%	C	6/2/04	5/20/04	■	6/2		
1.3.5.1.11	Demonstrate beam properties at Wide Band Lab (Milestone)	C	6/15/04	3/31/04	■	6/15		
1.4.5.4.1.4.2	BPM SW specification-offline-review complete	C	6/23/04	2/10/04	■	6/23		
1.4.5.4.1.5	Tev BPM: SW Specification complete	C	6/24/04	3/5/04	■	6/24		
1.4.5.4.1.1.6	Electronics design review complete	C	7/19/04	4/30/04	■	7/19		
1.4.7.1.2	Review Tevatron Alignment Plans 2004 (Milestone)	C	8/2/04	8/2/04	■	8/2		
1.2.1.1.2.1	Decision on long lithium lens (Milestone)	C	8/6/04	9/15/04	■	8/6		
1.2.1.2.1.5	Prototype Lens 1: Completed (Milestone)	C	8/6/04	9/15/04	■	8/6		
1.6.5.3	Review Recycler+E-Cooling Commissioning & Integration	C	8/10/04	8/10/04	■	8/10		
1.4.5.4.4.1.8	Integration Testing at Tevatron before Shutdown	C	8/18/04	8/24/04	■	8/18		
1.3.4.3.15	Extraction Commissioned	C	8/19/04	8/19/04	■	8/19		
1.4.5.4.3.1.1.1.4	Core electronics 1st modified board delivered	C	8/20/04	4/1/04	■	8/20		
1.4.5.4.4.1.3	First production quality crate Installation Begins	C	8/23/04	6/15/04	■	8/23		
1.5.3	Start Summer 04 Shutdown	C	8/23/04	8/23/04	■	8/23		
1.3.3.1.3.2.1.4	Pickup array design finalized	C	8/31/04	8/31/04	■	8/31		
1.3.3.1.3.2.2.4	Kicker array design finalized	C	8/31/04	8/31/04	■	8/31		
→ 1.2.2.7.4	Decision to procede with development of chromatic compensatio	C	9/23/04	9/20/04	■	9/23		
2.2.4.3.6.2	Decision on 6U Crate	C	10/12/04	10/12/04	■	10/12		
→ 1.4.2.1.1.3	Review TEL R&D	C	10/18/04	10/18/04	■	10/18		
→ 1.4.5.4.3.1.1.1.6	Core electronics 1st production board available	C	10/19/04	10/19/04	■	10/19		
1.4.5.4.3.2.2.2	Online SW code complete	C	10/20/04	10/21/04	■	10/20		
1.1.2.2.4.2	Beam Sweeping Ready (redefined)	A	10/21/04	10/21/04	■	10/21		
1.1.1.2.1.24	HLRF Upgrade complete	C	11/19/04	11/1/04	■	11/19		
1.1.1.2.2.6	MLRF upgrade complete	C	11/19/04	10/22/04	■	11/19		
1.2.2.10	Initial AP2&DB Improvements Complete (Milestone)	A	11/19/04	11/19/04	■	11/19		
1.5.4	Finish Summer 04 Shutdown	C	11/19/04	11/19/04	■	11/19		
1.4.5.4.3.2.1.3	Frontend DAQ SW code complete	C	11/24/04	11/29/04	■	11/24		

# Progress as of August 31, '04

WBS	WBS Name	Planned % Complete	Actual % Complete	A/P %
0	Run II Upgrades	46%	43%	95%
1	Luminosity Upgrades	48%	45%	94%
1.1	Protons on Pbar Target	56%	53%	94%
1.2	Pbar Acceptance	41%	37%	91%
1.3	Pbar Stacking & Cooling	54%	52%	97%
1.4	Tevatron High Luminosity	45%	41%	92%
1.6	Project Management	48%	47%	100%
2	Maintenance & Reliability	33%	33%	99%

Was 97% last month  
TEL Magnet delivery from BINP delayed one month

# M&S Costs through August '04

	FY04 Budget	YTD Obl	YTD Act.	8/04 PO	8/04 RIP	YTD Obl+RIP	(YTD Obl+RIP) /Budget
<b>Run II Upgrades</b>	<b>9,443</b>	<b>8,879</b>	<b>5,864</b>	<b>3,632</b>	<b>130</b>	<b>9,009</b>	<b>95%</b>
<b>1 Luminosity Upgrades</b>	<b>7824</b>	<b>7249</b>	<b>4910</b>	<b>2955</b>	<b>130</b>	<b>7379</b>	<b>94%</b>
1.1 Protons on Target	654	474	975	30	0	475	73%
1.2 pbar Acceptance	502	396	369	39	6	402	80%
1.3 pbar Stacking & Cooling	3053	2765	1665	1100	45	2810	92%
1.4 Tevatron High Luminosity	3522	3515	1802	1787	79	3594	102%
1.6 Management	93	99	99	0	0	99	106%
<b>2 Reliability &amp; Maintenance Upgrade</b>	<b>1,619</b>	<b>1,631</b>	<b>953</b>	<b>677</b>	<b>0</b>	<b>1,631</b>	<b>101%</b>
2.1 Vulnerability White Paper	798	829	405	423	0	829	104%
2.2 Reliability Upgrades	821	802	548	254	0	802	98%

\* Still checking/analyzing old code/new code transfers

# Effort for August '04

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<b>WBS</b>	<b>WBS Name</b>	<b>Actual FTE</b>	<b>v3 Proj</b>
	<b>Total</b>	<b>131.6</b>	<b>131.5</b>
1.1	Protons on Target	16.1	8.8
1.2	Pbar Acceptance	15.9	16.2
1.3	Pbar Stacking and Cooling	43.6	37.1
1.4	Tevatron High Luminosity	51.3	52.3
1.6	Mgmt	4.6	4.9
2	Reliability & Maintenance Upgrades	6.1	12.2

## Other

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- Pending Change Request - from the Electron Cooling AIP Contingency, need \$200K M&S and \$33K G&A
  - Overtime T&M for bus work, LCW and cable pulls
  - Increased scope for separate interlocked section to allow access for e-cool section → M&S
  - Each about \$100K M&S
- We are proceeding with the MI/Transfer-line BPM purchases with available funds