

Run II Upgrade

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PMG meeting

September 1, 2005

E-cooling

- **July 25, 2005**
 - **Electron Cooling used for shots to the Tevatron.**
 - E-beam current is decreased while cooling to avoid instabilities.
- **August 1, 2005**
 - The maximum observed value of the beam current is 0.5 A.
 - **All goals of the ECool's R&D phase are met.**
- **August 8, 2005**
 - The maximum observed beam current is 0.6A.
 - 24 eVs and ~4 pi-mm-mr with 110E10
 - Dampers were on.
- **August 29, 2005**
 - Stash was cooled to 7 eVs (42e10) and 9 eVs (110e10)
 - With the RR damper on (one dedicated study, one shot to Tev)
 - Below the 'blue' line

Instrumentation

- Tev BPMs Completed
- MI BPMs
 - Successful Technical Review => Update the requirements document
 - Work in Progress
 - Changed WBS structure to reflect new plans
- IPM
 - One detector assembled, one on its way
 - Expect to be ready for October Shutdown
- OTR
 - 5 are ready, 1 has vacuum leak
 - Foil development continues
 - Some ready for installation now, rest ready for October shutdown

Stacktail Cooling

- Assembly in progress – ready by October
- Request tank move studies during shutdown
 - May not fit into shutdown?
 - Then wait for opportunistic time

Question about Stacktail Cooling?

- Run II Upgrade Plan
 - Test tank move and new pickups during shutdown
 - Results help determine if stacktail upgrade is needed
 - Decide soon to fit into Upgrade Schedule
- Maybe upgrade not needed?
 - May not achieve production rate
 - Questions about likely success of stacktail cooling
- Make a decision
 - Follow Run II Upgrade
 - Or, make (major) change request to plan
 - Should be a formal process

Separators

- Electropolished SS R&D completed
 - With 178 kV, best spark rate and dark current so far
- 4 are conditioned
 - Have low spark rate
 - Dark current smaller for electropolished SS
- Spare is sparking
- Sixth is slated for Titanium electrode test
 - Straightness of electrode is not good
 - Need several months more work
- Shutdown priority
 - Install 2 new separators (Horizontal at A17, Vertical at B48)
 - Swap out the A4 separators (3 of them)

Upgrade Shutdown Activities

- Pbar studies
 - High intensity proton stacking & prototype upgrade tests
 - Prefer first two weeks of shutdown
 - If not, then study period in the fall.
- Pbar installations
 - Band 4 cooling tanks
 - Debuncher extraction kicker
- Tev installations
 - Separators
 - IPM
 - OTR
 - TEL-2
- Tevatron Alignment

No change to contingency according to Pushpa

- Estimate to complete: $\$18,104 - \$13,596\text{K} = \$4,508\text{K}$
- Contingency remaining: $\$20,946\text{K} - \$18,104\text{K} = \$2,842\text{K}$

Contingency Need estimate Obl. To complete

• MI BPM	\$200K	\$460K
• Rapid Transfers	\$100K	\$160K
• Recycler	\$200K	\$200K
• E-cool	\$200K	\$150K
• Stacktail	\$300K	\$700K
• Other	\$200K	

Major Concerns/New scope?

- Pbar Stack rate related \$300K
- Booster HLRF (SS + NUMI) \$300K → **\$1.8 M**

➤ Serious Vulnerability → Linac 7835 tubes

- Linac Task Force recommendation → explore Thales tubes
- Collaborate with Los Alamos; Test station ~ \$2 M

Run II upgrades are 71% complete which is 93% of the scheduled work as of July 31, 2005

WBS	Name	Actual %	Planned %	A/P %
0	Run II	71%	77%	93%
1	Luminosity Upgrades	72%	79%	92%
1.1	Protons on Pbar Target	58%	60%	96%
1.2	Pbar Acceptance	56%	69%	82%
1.3	Pbar Stacking & Cooling	82%	90%	91%
1.4	Tevatron High Luminosity	75%	80%	93%
1.5	Shutdowns	62%	62%	100%
1.6	Project Management	66%	71%	94%
2	Maintenance & Reliability	64%	64%	99%
2.1	2003 White Paper/Vulnerability Report	60%	58%	103%
2.2	Maintenance Improvements	69%	73%	95%
2.3	Project Management Oversight	62%	62%	100%

M&S Costs for FY05 and Inception to date (\$K)

M&S Spending through July 2005		Planned		Inception To Date Costs	
		Estimate	FY05		ITD Obl+RIP
		Total	Obl+RIP	ITD	/Total Est
Run II Upgrades		17,593	3,604	13,691	78%
1	Luminosity Upgrades	13,330	2,239	10,478	79%
1.1	Protons on Target	1,607	177	1,192	75%
1.2	pbar Acceptance	1,444	394	793	58%
1.3	pbar Stacking and Cooling	5,072	903	3,991	79%
1.4	Tevatron High Luminosity	5,207	713	4,349	84%
1.6	Management	154	52	154	100%
2	Reliability Upgrades	4,262	1,364	3,213	75%

Effort Report

Adjusted FTE July 2005		Totals	Plan 3 MO rolling ave.
Run II Upgrades		85.1	89.7
1	Luminosity Upgrades	75.3	78.6
1.1	Protons on Target	14.5	6.7
1.2	pbar Acceptance	6.6	8.4
1.3	pbar Stacking and Cooling	28.4	31.3
1.4	Tevatron High Luminosity	23.6	28.2
1.6	Management	2.0	4.0
2	Reliability Upgrades	9.8	11.1

Milestones

Tev BPM Upgrade Operational	B	Thu 6/30/05	Thu 3/31/05
Review Tevatron Alignment Plans 2005 (Milestone)	C	Mon 8/1/05	Mon 8/1/05
Start Summer 05 Shutdown	C	Mon 10/3/05	Mon 8/8/05
BLM Production Readiness Review	C	Tue 10/25/05	Fri 9/2/05
BLM Prototype System Operational	C	Tue 11/1/05	Mon 9/12/05
BLM Fully Commissioned Crate	C	Mon 12/5/05	Tue 10/4/05
Finish Summer 05 Shutdown	C	Fri 2/3/06	Mon 10/3/05