Run II Upgrades Status
December 2004 Report

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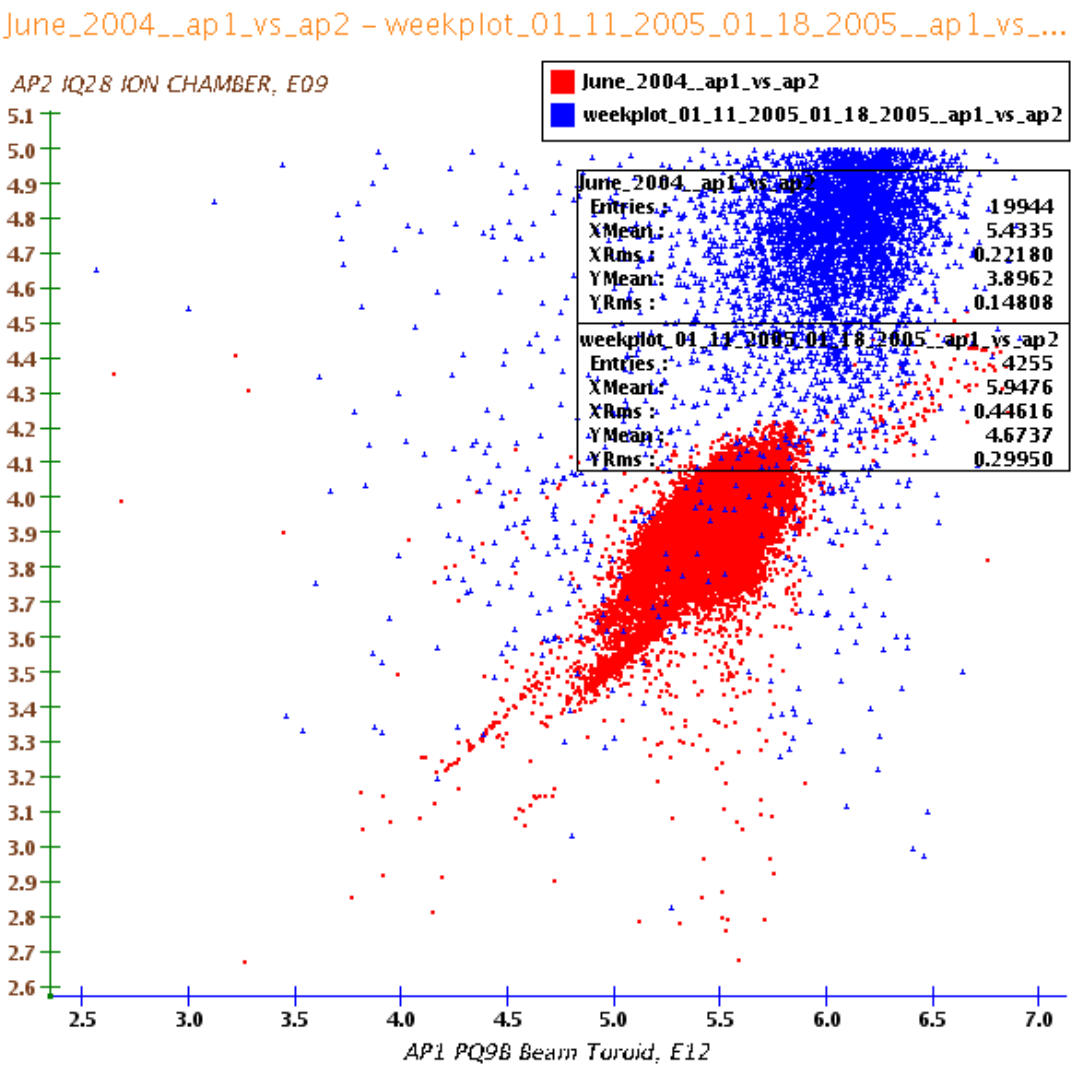
Outline

- Technical Highlights/ Progress
- Status Report for December '04
  - Milestones
  - % Complete
  - M&S Costs
  - Effort Report
- Other

Technical Highlights /Progress

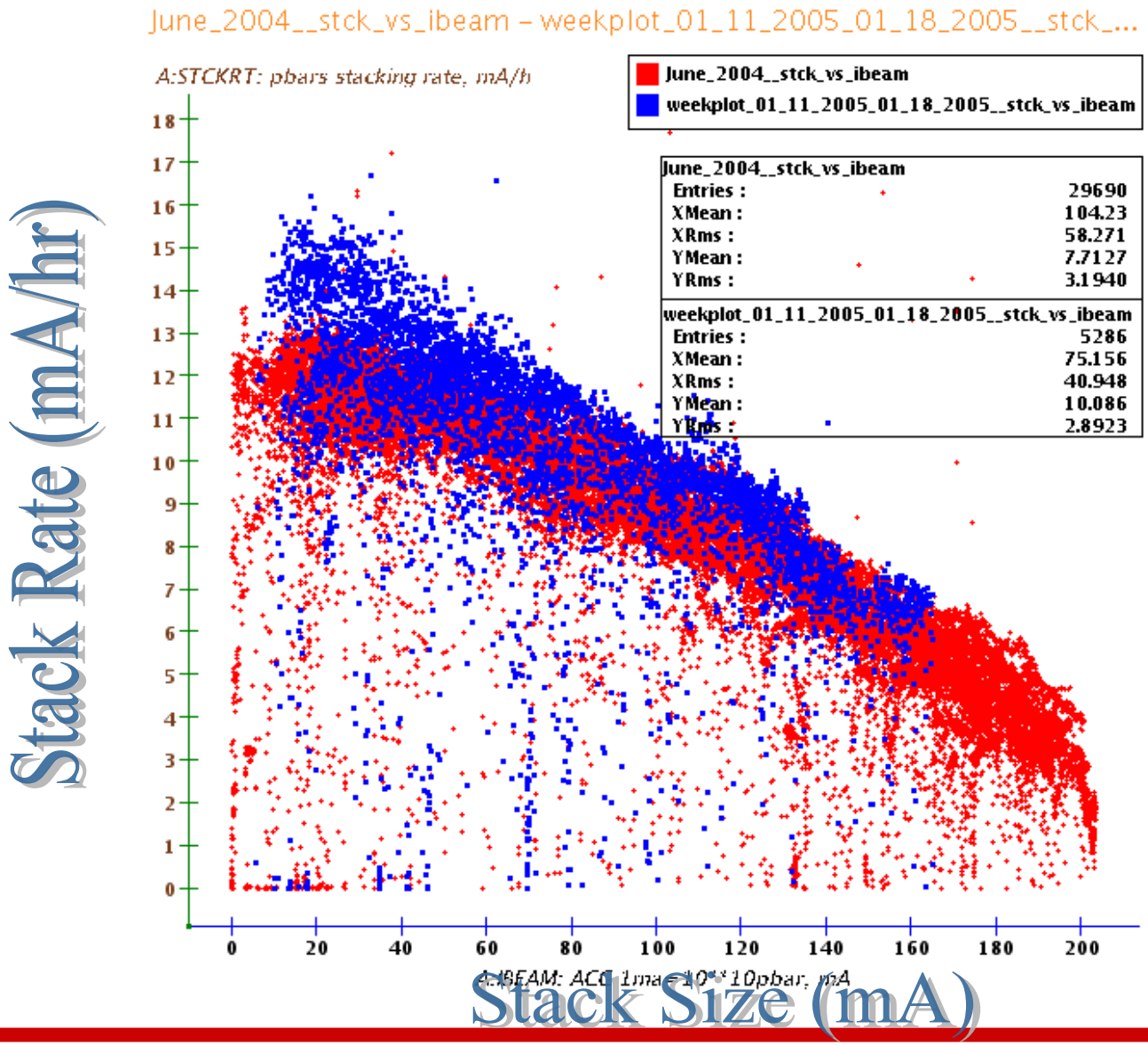
- Protons on target
  - Slip-stacking in MI Operational – Class A Milestone
    - Running typically with 6 – 6.5E12 protons on target.
    - Tuning and optimization of BLC with upgraded RF stations continue
    - Working on reducing beam loss
    - MLRF improvements continue
    - Have seen improved pbar production and stack rate

Beam in AP1, AP2



Effect of Beam-stop move +slip-stacking

Pbar Stack Rate



With Slip stacking

Stack Rate (mA/hr)

Stack Size (mA)

Technical Highlights / Progress (contd.)

- AP2/DB Acceptance
  - Verifying local bumps in the DB
  - Developing new pbar intensity measurement in Debuncher during stacking cycle
    - Reading out DB BPM in sum mode with 53 MHz RF
    - Expect 3-5% measurement
  - Changed emphasis from dedicated reverse proton studies to long semi-parasitic "while stacking" studies
    - Developing procedures to "bump around the Debuncher" and center moveable components
- AP2 BPM upgrade
  - Good progress being made
- Transfer-line BPM upgrade for Rapid transfers project
  - 88 BPMs in P1, P2, AP1, AP3 and A1 lines
  - All EchoTek boards in hand; software based on RR BPM software
  - Test crate commissioning in F23 was expected to happen by end of Jan. '05; maybe delayed due to key people being at the accelerator school

Technical Highlights / Progress (contd.)

- Tevatron
  - BPMs
    - New A3 BPMs (8) used for studies
      - Recently used to understand longitudinal beam blow-up
    - Commissioning around the ring being discussed with the Tevatron Department.
    - A3 commissioning continues. Closed orbit finished. TBT and first turn starting to function. A few bugs to work out, including possibly new firmware from Echotek.
    - 64 out of 150 filter boards and all 38 timing boards have arrived. Initial test results look fine.
    - Schedule to install 27 remaining houses show finish date in April 2005.
  - IPM, OTR
    - Expecting to be ready for installation by March 1, '05
    - (But, there are problems with the flex circuit carrying the anode signal & with front end QIE card)
    - Will require a minimum of 3 day shutdown for installation & vacuum bake (of the section) in the Tevatron
    - OTR also expected to be ready by March 1, '05. Installation of OTR detector in the Tevatron to occur at the same time as IPM.

e-cool/Pelletron Commissioning

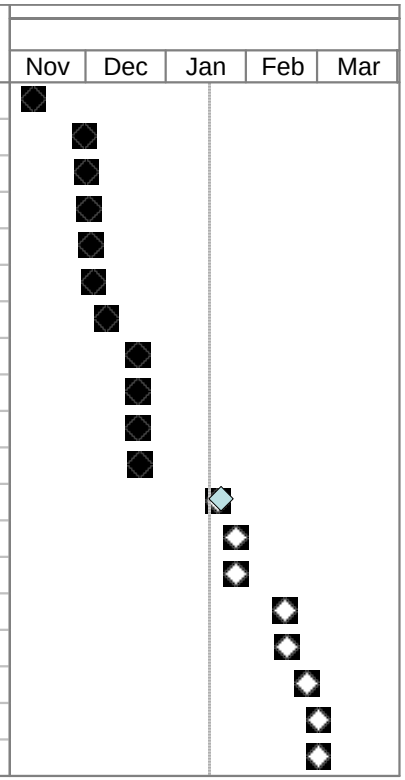
- Finishing up installation of various systems:
  - Pelletron internal components, vacuum systems, electronics, SF6 gas system piping, water chiller system, safety systems
- Expect to begin commissioning in early Feb.

• 2 Feb '05	All mechanical work on Pelletron completed.
• 3 Feb '05	Measure vibrations, mag fields
• 4 Feb. '05	Tests of Pelletron electronics
• 7 Feb '05	First HV test at the terminal (begin eve shifts)
• 10 Feb '05	Pulsed beam in the BPM below the tube
• 11 Feb '05	Last day of assembly work in MI-31
• 14 Feb '05	Begin HV conditioning (3 6h shifts/day)
• 22 Feb '05	5 MV; End of conditioning
• 25 Feb '05	Pulsed beam in the Collector
• 4 Mar '05	DC beam in the Collector
• 11 Mar '05	First tests of the Protection system
• 18 Mar '05	Pulsed beam up to the beam dump
• 21 Mar '05	First beam in the cooling section

Status Report

All Milestones (Nov. '04 – Feb. '05)

WBS	Name	MS Class	Finish	Base Fin
1.4.2.1.1.3	Review TEL R&D	C	11/10/04	10/18/04
1.5.4	Finish Summer 04 Shutdown	C	11/30/04	11/19/04
1.1.1.2.1.24	HLRF Upgrade complete	C	11/30/04	11/1/04
1.4.3.2.6	Polarity switches operational	C	12/1/04	12/30/04
1.4.3.4.3	New standard separators operational	A	12/2/04	12/16/04
1.3.3.1.3.1.2.3	Kicker tank design finalized	C	12/3/04	12/3/04
1.4.5.4.5.1.1	Begin system commissioning	C	12/8/04	12/9/04
1.1.1.4	Slip Stacking Operational	A	12/20/04	12/23/04
1.1.4.4	Booster-MI Cogging Operational	C	12/20/04	8/20/04
1.6.5.4	Start Phase 2 (Milestone)	A	12/20/04	12/23/04
1.2.2.10	Initial AP2&DB Improvements Complete (Milestone)	A	12/21/04	11/19/04
1.3.3.1.3.1.1.7	Pickup tank design finalized	C	1/20/05	1/21/05
1.4.5.4.3.2.2.2	Online SW code complete	C	1/27/05	10/21/04
1.4.5.4.3.2.3.2	Offline SW code complete	C	1/27/05	12/23/04
1.3.5.6.1	Pelletron Installed at MI-31 (Milestone)	C	2/15/05	2/1/05
1.1.1.2.2.6	MLRF upgrade complete	C	2/16/05	10/22/04
1.4.5.4.3.2.1.3	Frontend DAQ SW code complete	C	2/24/05	11/29/04
1.1.3.3.5	MI 2.5 MHz Acceleration complete	B	2/28/05	1/31/05
1.2.2.7.4	Decision to proceed with development of chromatic compensati	C	2/28/05	9/20/04



Progress as of December 30, '04

WBS	Name	Actual %	Planned %	A/P %
0	**Run II Upgrades**	**59%**	**61%**	**97%**
1	**Luminosity Upgrades**	**62%**	**64%**	**97%**
1.1	Protons on Pbar Target	58%	62%	94%
1.2	Pbar Acceptance	44%	50%	88%
1.3	Pbar Stacking & Cooling	71%	73%	97%
1.4	Tevatron High Luminosity	63%	64%	99%
1.5	Shutdowns	40%	40%	100%
1.6	Project Management	53%	53%	100%
2	**Maintenance & Reliability**	**44%**	**44%**	**99%**

M&S Spending through Dec. 04

M&S Spending through December 2004		Planned from MSP file 12/13/04			Current Year Costs		ITD Costs		% FY05
		RLS Estimate (then yr$)			FY05	FY05		ITD Obl+RIP	YTD Obl+RIP
		FY04	FY05	Total	Allocation	Obl+RIP	Obl+RIP	/Total Est	/FY05 Allocation
Run II Upgrades		**7,822**	**7,294**	**18,647**	**5,153**	**1,883**	**12,047**	**65%**	**37%**
1	**Luminosity Upgrades**	**6,085**	**5,616**	**14,105**	**3,961**	**1,139**	**9,455**	**67%**	**29%**
1.1	**Protons on Target**	**1,114**	**96**	**2,163**	**505**	**66**	**1,096**	**51%**	**13%**
1.1.1	Slip Stacking	911	9	920	10	7	381	41%	65%
1.1.2	Pbar Target and Sweeping	81	11	93	0	-3	12	13%	
1.1.3	MI Upgrades	18	7	977	446	0	504	52%	0%
1.1.4	Booster-MI Cogging	0	0	0	0	0	0		
1.1.5	OTR	104	68	172	49	62	200	116%	127%
1.2	**pbar Acceptance**	**688**	**454**	**1,693**	**396**	**130**	**576**	**34%**	**33%**
1.2.1	LiLens	308	70	603	181	86	208	35%	48%
1.2.2	AP2 and DB Acceptance	380	384	1,090	215	44	368	34%	21%
1.3	**pbar Stacking and Cooling**	**2,041**	**2,633**	**4,734**	**1,202**	**456**	**3,549**	**75%**	**38%**
1.3.1	S&C Task Force	0	0	0	0	0	0		
1.3.2	Debuncher Cooling	0	0	0	0	0	0		
1.3.3	Stacktail Upgrade	243	1,218	1,461	620	56	747	51%	9%
1.3.4	Recycler Commissioning	242	227	469	201	35	242	52%	18%
1.3.5	Electron Cooling	1,523	720	2,243	151	306	2,187	97%	202%
1.3.6	Rapid Transfers	33	468	561	230	60	372	66%	26%
1.4	**Tevatron High Luminosity**	**2,150**	**2,433**	**5,423**	**782**	**486**	**4,132**	**76%**	**62%**
1.4.1	Beam Studies and Simulation	40	0	40	0	0	41	102%	
1.4.2	Active BBC	347	369	1,532	200	115	593	39%	57%
1.4.3	Increased Helix Separation	559	512	1,078	207	151	956	89%	73%
1.4.4	Luminosity Leveling	0	0	0	0	0	0		
1.4.5	Improved Controls and Diagnostics	886	1,370	2,256	211	192	2,110	94%	91%
1.4.6	Tevatron Vacuum Improvements	154	0	154	80	4	197	128%	5%
1.4.7	Tevatron Alignment	163	182	362	84	24	235	65%	28%
1.6	**Management**	**93**	**0**	**93**	**1,076**	**0**	**102**	**110%**	**0%**
2	**Reliability Upgrades**	**1,737**	**1,678**	**4,542**	**1,192**	**745**	**2,592**	**57%**	**62%**

Effort for December '04

Adjusted FTE December 2004		Actual	Plan
Run II Upgrades		121.6	109.3
1	Luminosity Upgrades	115.2	98.0
1.1	Protons on Target	12.3	9.0
1.2	pbar Acceptance	6.7	7.9
1.3	pbar Stacking and Cooling	35.5	35.4
1.4	Tevatron High Luminosity	57.9	41.1
1.6	Management	2.8	4.6
2	Reliability Upgrades	6.4	11.3

Change Requests

- Discussed at the last PMG
  - e-cool commissioning $380K
  - TEL FY03/FY04 overrun $118K
  - Other
    - Tev vacuum improvements $80K
    - RR trans. Damper (re-est.) $50K
    - Stacktail Prototype $50K
  - Total: $678K