



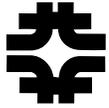
Overview of Accelerator Operations

Steve Holmes

DOE Tevatron Operations Review

March 27, 2007

http://www.fnal.gov/directorate/DOE_TeVOps07_Review.html



Outline

- Accelerator Program Mission
- History of Run II and NuMI performance
- Goals: FY07-09
- Major Achievements since March 2006 Review
- Resources



Accelerator Program Mission

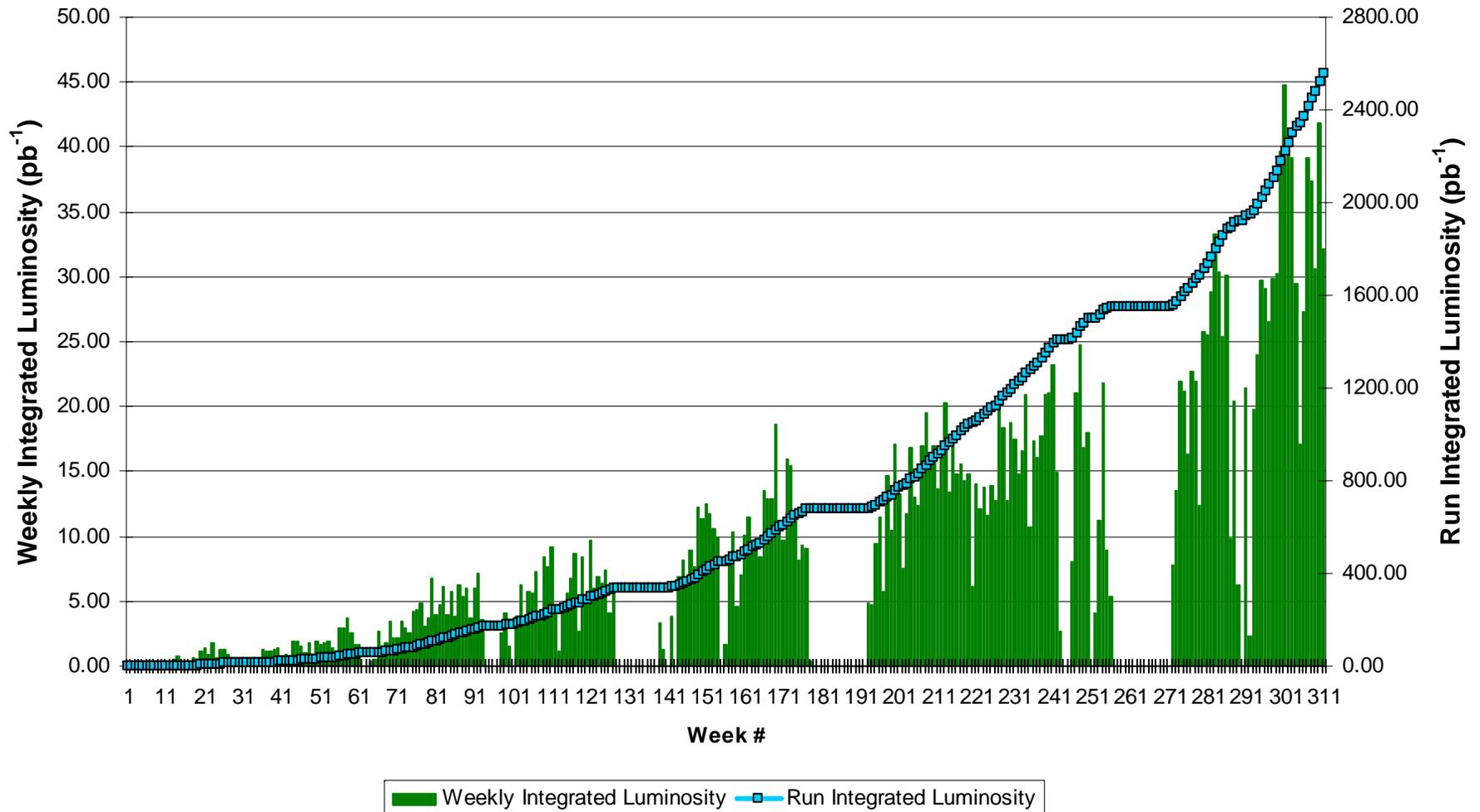
- Operations Review:
 - Maintenance and operation of the accelerator complex in support of the HEP research program
 - Improvement of accelerator performance to meet evolving goals
 - Scope:
 - Collider Run II
 - NuMI/Proton Plan

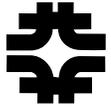
- Program Review:
 - R&D in accelerator technologies aimed at next generation HEP facilities and beyond.
 - Construction of new accelerator facilities



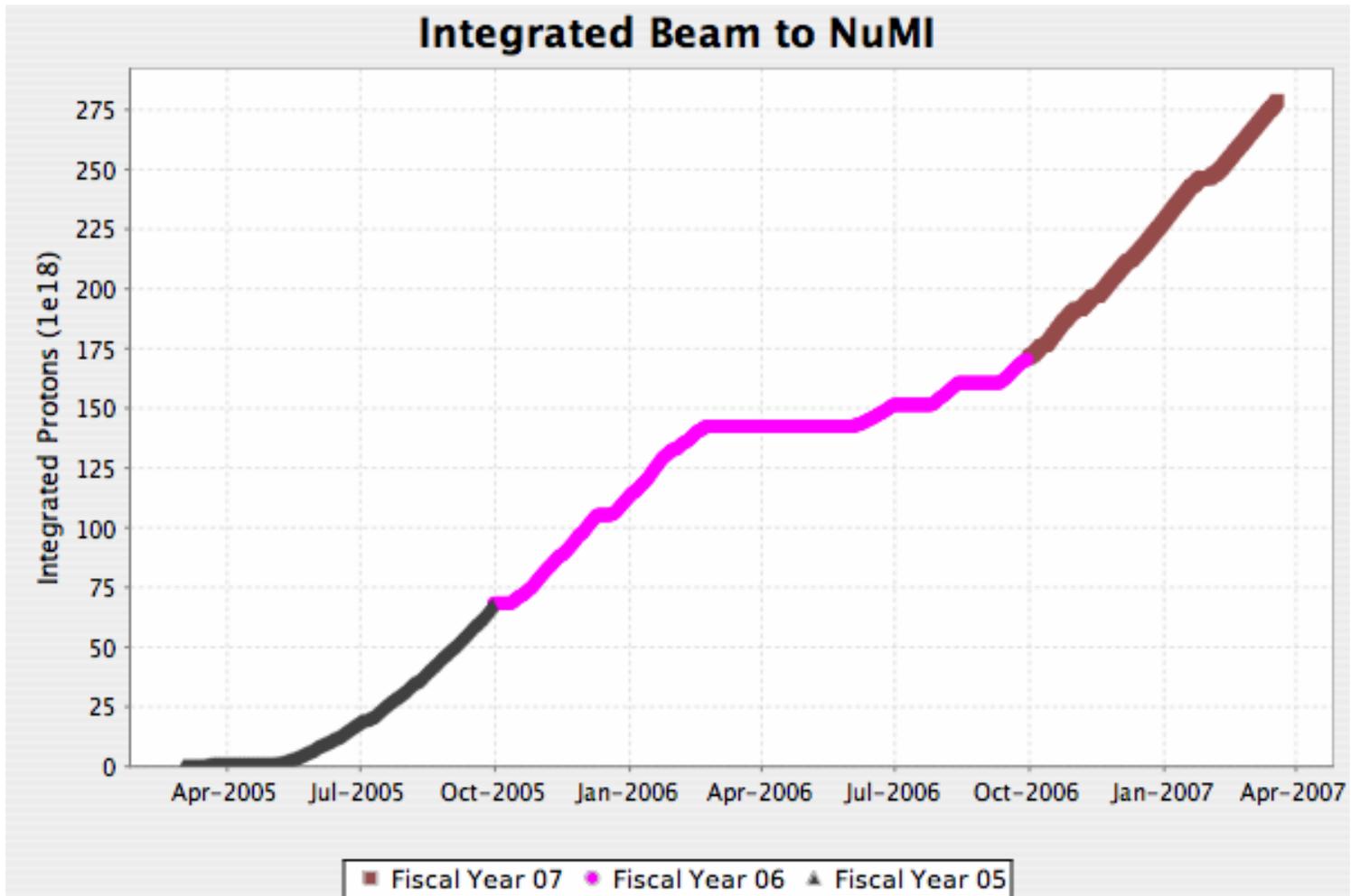
History of Run II

Collider Run II Luminosity





History of NuMI

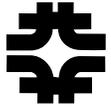




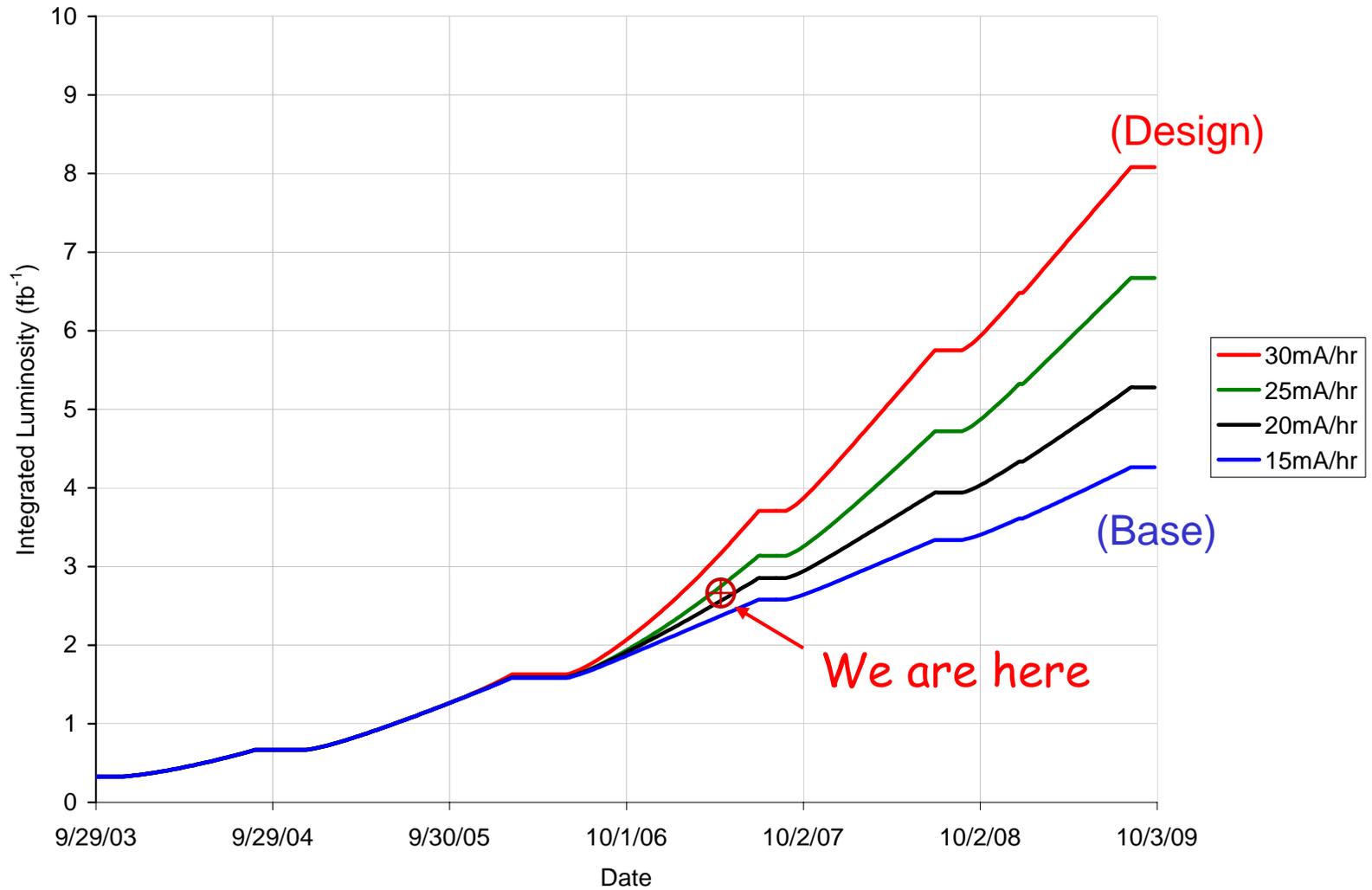
Accelerator Operations Goals

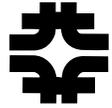
- Strategy
 - Run CDF and D0 through FY2009
 - Run MINOS (and perhaps MiniBoone or successors) through/beyond the end of decade
 - Proton Plan goal: 320 kW on target
 - Utilize freed accelerator assets to support the post-Run II neutrino program
 - NOvA goal: 700 kW (early post-Run II era)
 - Operate 120 GeV fixed target program in parallel
 - Set stage for the future

 - FY07-09 Goals
 - Run II: Get to 8 fb⁻¹ (design curve, total)
 - Neutrino Program: Complete the Proton Plan @ 320 kW
 - NuMI: Deliver ~3E20 protons on target/year in FY09
 - 8 GeV: Deliver 1-2E20 protons on target/year
 - SY120: Operate in parallel with Run II and neutrinos
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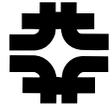
Run II Goals: FY06-09





Past Year Achievements

- Run II
 - Completed the Run II Luminosity Upgrade program
 - Capitalization on improvements continues
 - 621 pb⁻¹ in FY2006, ~700 pb⁻¹ FY2007 to date
 - Antiproton stacking rate beyond 23E10/hour
 - Typical luminosity now 2.3E32, record 2.9E32
 - FY07 performance near design curve for instantaneous luminosity, ~midway between design and base for integrated
 - Two Tevatron magnet failures resulting in ~3 weeks of unscheduled downtime
 - FY2007 shutdown (~8 weeks) schedule for summer



Past Year Achievements

- NuMI
 - 1.0E20 POT in FY2006, ~1.1E20 FY2007 to date
 - 180-200 kW on target coincident with antiproton production
 - Substantial progress on tritium mitigation
 - Proton Plan underway - major advances on slip-stacking

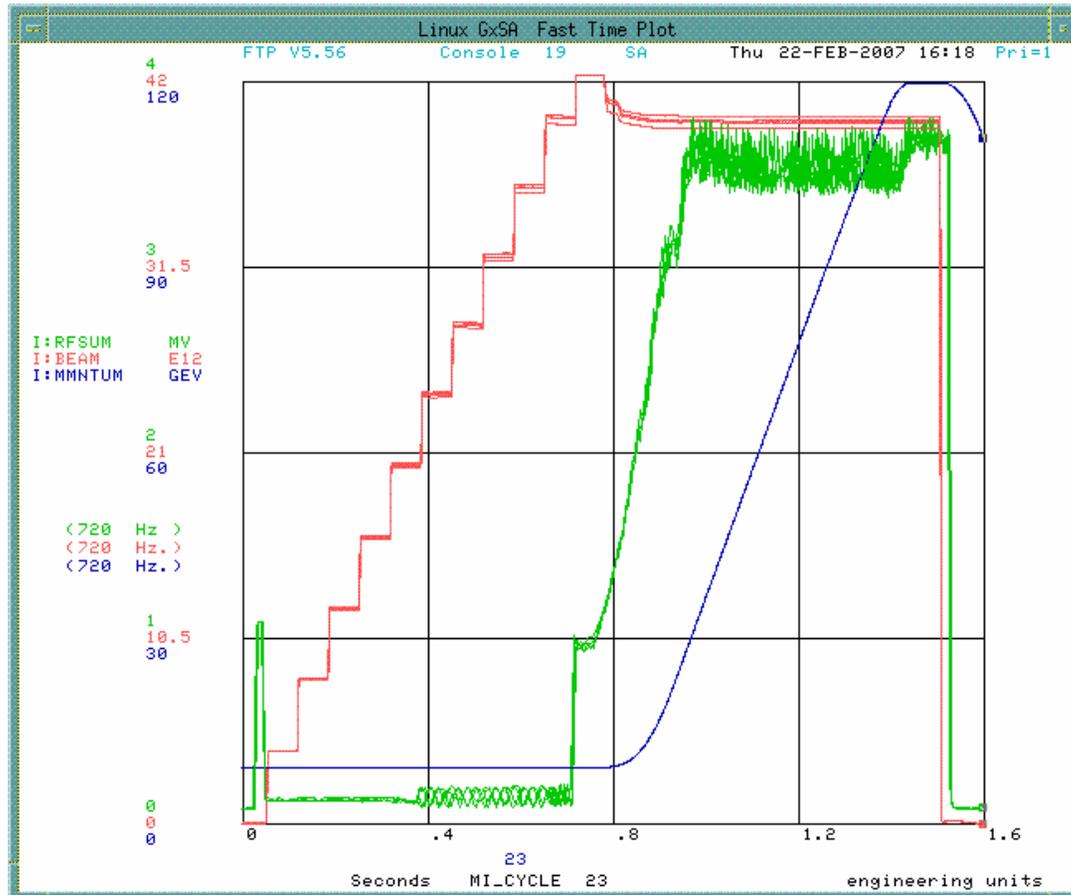
- ES&H Performance (March 2006 - March 2007)
 - AD: 11 OSHA recordable, 2 lost workday cases (LWCR=0.39/200,000 hours worked)
 - TD: 4 OSHA recordable, 0 lost workday cases (currently 1.6x10⁶ hours worked, ≈4 years, without a LWC)

- MiniBoone
 - Capability to deliver 1-2E20 in parallel with NuMI operations
 - Currently off due to failure in intermediate absorber



Past Year Achievements

Proton Plan



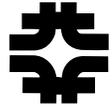
- Slip-stacking of 11 Booster batches
- Record $4.05E13$ proton delivered to NuMI target
- Proton Plan goal is $4.5E13$



Resources

		Accelerator Operations Budget		
		(Dollar amounts in millions, all overheads included)		
		FY07	FY08 PBR	FY09 Request
ACCELERATOR M&O		\$69.4	\$67.9	\$68.3
PROTON PLAN		\$10.9	\$3.9	\$0.3
ACCELERATOR UPGRADES - R2LU		\$0.6	\$0.0	\$0.0
ACCELERATOR UPGRADES - OTHER		\$3.8	\$0.0	\$1.9
MINIBOONE, FT EXPS & EXT BEAMS		\$4.0	\$4.0	\$4.0
NuMI / MINOS		\$4.5	\$5.0	\$4.9
POWER & UTILITIES		\$20.9	\$25.9	\$29.4
Operations Total, SWF + M&S		\$114.1	\$106.8	\$108.9

- FY08 PBR based on preliminary allocation as discussed in FNAL/DOE budget briefing 3/9
 - ~\$2M shortfall in FY08 Accelerator M&O
 - Decreased reliability (hard to quantify as reduced pb⁻¹)
- FY09 Request as contained in Fermilab WPAS submission



Summary: A very good year!

- Run II Luminosity Upgrade program complete, and supporting record performance
 - Total luminosity through FY2009 is likely to lie in the range 6-8 fb⁻¹ (8 remains the goal)
 - Antiproton stacking rate is the primary remaining variable
 - NuMI is running very well.
 - ~190 kW on target coincident with pbar production
 - Tritium remediation
 - Proton Plan underway with goal of 320 kW in FY08-09
 - Booster Neutrino Beam in parallel with Run II & NuMI
 - Resources are being managed effectively, and safely, in support of the program.
 - Staff reallocation from Run II to R&D as program winds down
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