Run II Upgrade

- no monthly status report for December
- reported status for Sep+Oct+Nov against v1.0
- will report Jan against v2.0

v2.0

- Timeline ← we're behind
- milestone and cost summary vs v1.0
- change requests

- MSP - Jeff, Ken and Dean
- Doc - Pushpa, Peter
- Doc'n - Vaia
- Cost tracking - Peter
- Luminosity projection - Dave

Timeline (delay in MSP input)

- Tue Jan 13 - doors closed for new input to MSP v2.0 (was to be Dec 15, then Dec 31)
- Wed Jan 14 - fix resource table, check for structural bugs, bug fixes

- milestone dates and M&S costs should be good at this point, labor costs need checking

- Thur Jan 15 - PMG, and last call for bug fixes before Temple review
- Fri Jan 16 - prepare wall chart for Temple Review, distribute schedule to L3 managers

- Temple Review: milestones, M&S and Labor profiles, luminosity projection, no WBS Dictionary and BoE

- Thu Jan 22 - request Dictionary and BoE input by Feb 6 (2 weeks) , request status update for January versus v2.0

- Fri Jan 23 - document complete as internal draft
- Fri Jan 30 - document due to DOE

- Fri Feb 6 - DEADLINE for input to WBS Dictionary and BoE
- Fri Feb 13 - final bug fix or necessary update before DOE review, Dictionary and BoE edited

- Wed Feb 18-19 DOE Review rehearsal
- Fri Feb 20 Prepare wall chart and ring binders for DOE review
- Tue Feb 24-26 DOE Review

MSP

- Line count
  - v1.0=727, v2.0=1358 ←!
  - replaced sections (e.g.Tev Separator plan), added sections (e.g. Recycler, Tev BPM), reviewed/updated all
  - estimate 45% of v2.0 is updated and 55% is new
- Changed the WBS to fit AD/Lab system
  - 1.2 Maint and Reliability →[20.]27
  - 1.3 Luminosity Upgrades →[20.]26
  - 1.1 Operations → department operating
- Changed definition of MS hierarchy
  - V1.0
    - A=top level that drive the luminosity profile
    - B=major scope decisions (essentially all now completed)
    - C=internal reviews and tracking
  - V2.0
    - A= as above
    - B= completion of major work that is not A
    - C= as above
- MSP Shutdowns (add one week for luminosity projection)
  - O4: 13 weeks 8/23/04 – 11/22/04
  - 05: 8 weeks 8/8/05 – 10/3/05
  - 06: 8 weeks 8/7/06 – 10/2/06

Milestones

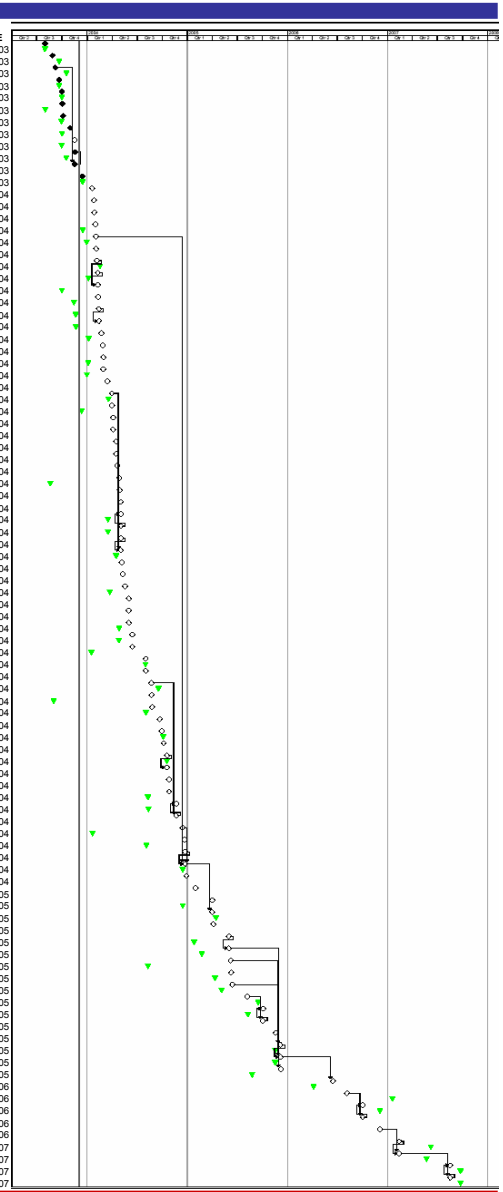
All milestones, time ordered

94 milestones in v2.0
58 in v1.0

74 in next two years = 3/month!

v2.0 all milestones time ordered

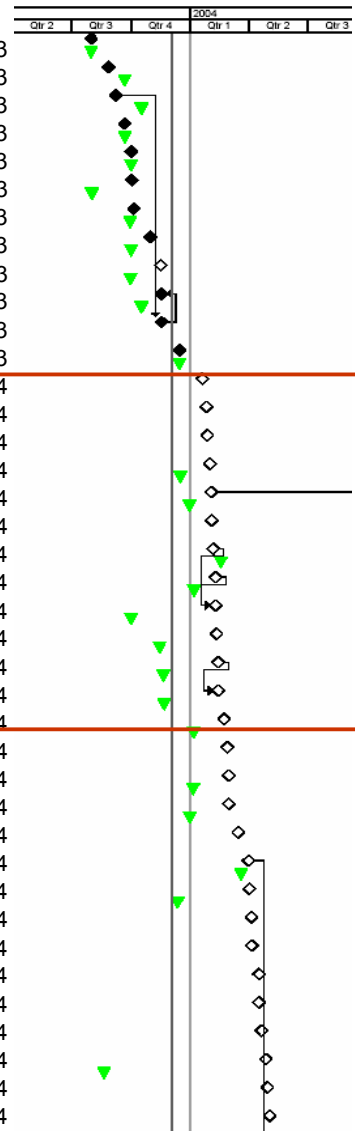
WBS	TASK	CLASS	DATE
26.4.8.1	Review Tevatron Alignment Plans (Milestone)	C	8/1/03
26.1.1.6	Design Review (Milestone)	C	8/28/03
26.5.1	Start Summer 03 Shutdown	C	9/8/03
26.4.6.4.1	Tev BPM: Requirements Review (Milestone)	C	9/22/03
26.4.6.5.1	Tev IPM Design Review, decision to proceed (Milestone)	C	10/1/03
26.1.3.3.2	Review MI 2.5 MHz Acceleration (Milestone)	C	10/2/03
26.6.2.1	Review: Tevatron Upgrade Plan	C	10/6/03
26.3.4.2	Commissioning Parameters Defined (Milestone)	C	10/31/03
26.3.4.7.5	FY03 plan includes vacuum work in FY03 shutdown (Milestone)	C	11/17/03
26.4.7.1	FY03 plan includes FY03 shutdown (Milestone)	C	11/17/03
26.5.2	Finish Summer 03 Shutdown	C	11/17/03
26.4.6.4.1	Core HW technical choice review complete	C	12/16/03
26.3.4.9.2	Vacuum performance	C	1/19/04
26.3.4.7.1	Vacuum milestone	C	1/26/04
26.3.4.9.4	Vacuum and Machine admittence	C	1/27/04
26.6.2.2	Review Recycler and Electron Cooling Commissioning Plan	A	2/1/04
26.1.2.1.4	New Target in Operation (Milestone)	A	2/2/04
26.3.4.7.1	Vacuum and Machine Acceptance	C	2/3/04
26.4.6.4.1	BPM SW specification-frontend DAQ - review complete	C	2/6/04
26.4.6.4.1	BPM SW specification-offline-review complete	C	2/9/04
26.4.6.4.2	Tev BPM: SW Specification complete	C	2/9/04
26.3.4.4	Commissioning Plan Evaluation (Milestone)	C	2/10/04
26.4.6.4.3	Core electronics PO complete	C	2/13/04
26.4.6.4.3	BPM consolidated crate PO complete	C	2/13/04
26.4.6.4.1	BPM SW specification-online-review complete	C	2/23/04
26.3.4.9.6	MI to RR Trans >85% round trip <3 pi growth	C	2/27/04
26.3.3.1.1	Review System Design: stacktail momentum (Milestone)	C	3/1/04
26.3.5.2.1	Pelletron extension parts received	C	3/1/04
26.3.4.9.8	Stacking Performance with 100E10	C	3/15/04
26.3.5.1.11	Demonstrate beam properties at Wide Band Lab (Milestone)	C	3/31/04
26.4.6.4.3	Core electronics 1st modified board delivered	C	4/1/04
26.3.6.5.1	Review specifications and plan for transfer line BPM upgrade	C	4/5/04
26.3.4.9.10	Equilibruim Porpperties at 200 E10	C	4/5/04
26.1.4.4	Booster-MI Cogging Operational	B	4/16/04
26.2.2.3.1	Decision to Proceed with AP2 BPM DAQ Upgrade	C	4/16/04
26.3.4.9.12	Recycler Rapid Transfer Commissioned	C	4/20/04
26.4.6.4.1	Electronics design review complete	C	4/28/04
26.3.6.6.3	Review 8Gev energy match plan	C	4/29/04
26.1.1.7.23	Slip Stacking HLRF order deliveries 50%	C	5/3/04
26.2.1.1.2	Decision on long lithium lens (Milestone)	C	5/3/04
26.2.1.2.1	Prototype Lens 1: Completed (Milestone)	C	5/3/04
26.3.4.9.14	Extraction Commissioned	C	5/3/04
26.6.2.3	Review: Phase Phase 2-4 Transition Plan	C	5/3/04
26.4.4.2.6	Polarity switches operational	C	5/6/04
26.4.3.2.2	BBC: Wires - Report Review	C	5/10/04
26.4.3.1.5	Review TEL R&D	C	5/18/04
26.3.4.9.16	Recycler commissioned for Electron cooling	A	6/1/04
26.4.6.4.3	Core electronics 1st production board available	C	6/1/04
26.4.6.4.3	Offline SW code complete	C	6/1/04
26.4.6.4.3	Online SW code complete	C	6/14/04
26.4.6.4.4	First production qualty crate available at Tevatron	C	6/15/04
26.4.6.4.5	Begin system commissioning	C	8/2/04
26.1.1.8.8	MLRF upgrade complete	C	8/2/04
26.5.3	Start Summer 04 Shutdown	C	8/23/04
26.4.6.4.4	System commissioning plan complete	C	8/23/04
26.4.6.4.3	Frontend DAQ SW code complete	C	8/25/04
26.1.1.7.24	LLRF Upgrade complete	C	9/22/04
26.4.6.4.4	Full system test complete	C	9/29/04
26.4.4.4.2	Decision to proceed with mini separators	C	10/6/04
26.4.6.4.5	Electronics comissioning complete	C	10/18/04
26.4.6.4.6	Tev BPM Upgrade Operational	B	10/18/04
26.4.4.3.1	New standard separators operational	A	10/25/04
26.3.5.6.1	Pelletron Installed at MI-31 (Milestone)	C	10/26/04
26.2.2.10	Initial AP2&DB Improvements Complete (Milestone)	A	11/22/04
26.5.4	Finish Summer 04 Shutdown	C	11/22/04
26.1.2.2.4	Beam Sweeping Operational (Milestone)	A	12/14/04
26.1.3.2.2	MI BPM: Review (Milestone)	C	12/21/04
26.1.1.10	Slip Stacking Operational	A	12/23/04
26.6.2.4	Start Phase 2 (Milestone)	A	12/23/04
26.4.6.5.4	IPM Operational	C	12/28/04
26.1.3.3.5	MI 2.5 MHz Acceleration complete	B	1/31/05
26.4.3.1.6	Decision on second production TEL	C	4/1/05
26.6.3.1	Start Phase 2 contingency (Milestone)	A	4/1/05
26.2.2.7.4	Decision to procede with development of chromatic compensation	C	4/6/05
26.3.5.12	Electron Cooling Operational (Milestone)	A	6/1/05
26.6.2.5	Start Phase 3 (Milestone)	A	6/1/05
26.3.3.1.2	Stacktail Reconfigured (option) (Milestone)	C	6/8/05
26.2.1.4	New Lens Operational (Milestone)	A	6/10/05
26.3.6.7	Rapid Transfers Operational (Milestone)	A	6/14/05
26.5.5	Start Summer 05 Shutdown	C	8/8/05
26.2.2.11	Intermediate AP2&DB Improvements Complete (Milestone)	A	10/3/05
26.5.6	Finish Summer 05 Shutdown	C	10/3/05
26.1.3.2.9	MI BPM system complete	B	11/18/05
26.3.3.1.9	Stacktail Momentum Operational (Milestone)	A	12/6/05
26.6.2.6	Start Phase 4 (Milestone)	A	12/6/05
26.6.3.2	Start Phase 3 contingency (Milestone)	A	12/8/05
26.6.3.3	Start Phase 4 contingency (Milestone)	A	6/16/06
26.5.7	Start Summer 06 Shutdown	C	8/7/06
26.2.2.12	Final AP2&DB Improvements Complete (Milestone)	A	10/2/06
26.5.8	Finish Summer 06 Shutdown	C	10/2/06
26.4.4.4.14	New helix operational	A	12/5/06
26.4.3.1.11	TEL System Operational	A	2/12/07
26.6.2.7	Start Phase 5 (Milestone)	A	2/12/07
26.6.2.8	End Project	A	8/17/07
26.6.3.4	Start Phase 5 contingency (Milestone)	A	8/17/07



Near Term

v2.0 near term milestones

WBS	TASK	CLASS	DATE
26.4.8.1	Review Tevatron Alignment Plans (Milestone)	C	8/1/03
26.1.1.6	Design Review (Milestone)	C	8/28/03
26.5.1	Start Summer 03 Shutdown	C	9/8/03
26.4.6.4.1.1.1	Tev BPM: Requirements Review (Milestone)	C	9/22/03
26.4.6.5.1.5.11	Tev IPM Design Review, decision to proceed (Milestone)	C	10/1/03
26.1.3.3.2	Review MI 2.5 MHz Acceleration (Milestone)	C	10/2/03
26.6.2.1	Review: Tevatron Upgrade Plan	C	10/6/03
26.3.4.2	Commissioning Parameters Defined (Milestone)	C	10/31/03
26.3.4.7.5.1	FY03 plan includes vacuum work in FY03 shutdown (Milest	C	11/17/03
26.4.7.1	FY03 plan includes FY03 shutdown (Milestone)	C	11/17/03
26.5.2	Finish Summer 03 Shutdown	C	11/17/03
26.4.6.4.1.1.3.1.2	Core HW technical choice review complete	C	12/16/03
26.3.4.9.2	Vacuum performance	C	1/19/04
26.3.4.7.1.2.5.6	Vacuum milestone	C	1/26/04
26.3.4.9.4	Vacuum and Machine admittence	C	1/27/04
26.6.2.2	Review Recycler and Electron Cooling Commissioning Plar	A	2/1/04
26.1.2.1.4.3	New Target in Operation (Milestone)	A	2/2/04
26.3.4.7.1.2.5.7.1.3	Vacuum and Machine Acceptance	C	2/3/04
26.4.6.4.1.2.2	BPM SW specification-frontend DAQ - review complete	C	2/6/04
26.4.6.4.1.4.2	BPM SW specification-offline-review complete	C	2/9/04
26.4.6.4.2	Tev BPM: SW Specification complete	C	2/9/04
26.3.4.4	Commissioning Plan Evaluation (Milestone)	C	2/10/04
26.4.6.4.3.1.2.1.2	Core electronics PO complete	C	2/13/04
26.4.6.4.3.1.3	BPM consolidated crate PO complete	C	2/13/04
26.4.6.4.1.3.2	BPM SW specification-online-review complete	C	2/23/04
26.3.4.9.6	MI to RR Trans >85% round trip <3 pi growth	C	2/27/04
26.3.3.1.1.5	Review System Design: stacktail momentum (Milestone)	C	3/1/04
26.3.5.2.1	Pelletron extension parts received	C	3/1/04
26.3.4.9.8	Stacking Performance with 100E10	C	3/15/04
26.3.5.1.11	Demonstrate beam properties at Wide Band Lab (Milestone	C	3/31/04
26.4.6.4.3.1.2.1.3	Core electronics 1st modified board delivered	C	4/1/04
26.3.6.5.1.2	Review specifications and plan for transfer line BPM upgrac	C	4/5/04
26.3.4.9.10	Equilibruim Porpperties at 200 E10	C	4/5/04
26.1.4.4	Booster-MI Cogging Operational	B	4/16/04
26.2.2.3.1.1.2	Decision to Proceed with AP2 BPM DAQ Upgrade	C	4/16/04
26.3.4.9.12	Recycler Rapid Transfer Commissioned	C	4/20/04
26.4.6.4.1.1.6	Electronics design review complete	C	4/28/04
26.3.6.6.3	Review 8Gev energy match plan	C	4/29/04
26.1.1.7.23	Slip Stacking HLRF order deliveries 50%	C	5/3/04



Now

DOE Review

Class A Milestones Compared

Class A Milestones					
WBS	TASK	v2.0	v1.0	DAYS	
26.6.2.2	Review Recycler and Electron Cooling Commissioning Plan	02/01/04	12/16/03	47	
26.1.2.1.4.3	New Target in Operation (Milestone)	02/02/04	12/30/03	34	
26.3.4.9.16	Recycler commissioned for Electron cooling	06/01/04	7/2/04	-31	
26.4.4.3.1.5	New standard separators operational	10/25/04			
26.2.2.10	Initial AP2&DB Improvements Complete (Milestone)	11/22/04			
26.1.2.2.4.2	Beam Sweeping Operational (Milestone)	08/25/04	1/21/04	217	
26.1.1.10	Slip Stacking Operational	12/23/04	12/14/04	9	
26.6.2.4	Start Phase 2 (Milestone)	12/23/04	12/14/04	9	Slip Stacking
26.6.3.1	Start Phase 2 contingency (Milestone)	04/01/05	4/15/05	-14	
26.3.5.12	Electron Cooling Operational (Milestone)	06/01/05	1/25/05	127	
26.6.2.5	Start Phase 3 (Milestone)	06/01/05	2/22/05	99	Electron Cooling
26.2.1.4	New Lens Operational (Milestone)	06/10/05	4/11/05	60	
26.3.6.7	Rapid Transfers Operational (Milestone)	06/14/05	5/5/05	40	
26.2.2.11	Intermediate AP2&DB Improvements Complete (Milestone)	10/03/05			
26.3.3.1.9	Stacktail Momentum Operational (Milestone)	12/06/05	11/17/05	19	
26.6.2.6	Start Phase 4 (Milestone)	12/06/05	11/17/05	19	Stacktail Upgrade
26.6.3.2	Start Phase 3 contingency (Milestone)	12/08/05	8/25/05	105	
26.6.3.3	Start Phase 4 contingency (Milestone)	06/16/06	4/6/06	71	
26.2.2.12	Final AP2&DB Improvements Complete (Milestone)	10/02/06	12/4/06	-63	
26.4.4.4.14	New helix operational	12/05/06	3/22/07	-107	
26.4.3.1.11	TEL System Operational	02/12/07	5/23/07	-100	
26.6.2.7	Start Phase 5 (Milestone)	02/12/07	5/23/07	-100	Helix and BBC

Phase Milestones "Contingency" (Blue Curve)			
Start Phase	MS	MScont	months
2	12/23/04	04/01/05	3
3	06/01/05	12/08/05	6
4	12/06/05	06/16/06	6
5	02/12/07		6

M&S Cost Comparison

Base M&S has increased by $1.3M

WBS	NAME	v2.0 Base M&S	v1.0 Base M&S	Difference	Difference Drivers
26	Luminosity Upgrades	$12,906,426	$11,561,460	$1,344,966	
26.1	**Protons on Pbar Target - Ioanis Kourbanis**	**$1,911,500**	**$2,331,500**	**($420,000)**	
26.1.1	Slip Stacking	$895,000	$1,310,000	($415,000)	PA's cheaper
26.1.2	Pbar Target and Sweeping	$91,500	$96,500	($5,000)	
26.1.3	MI Upgrades	$925,000	$925,000	$0	
26.1.4	Booster-MI Cogging	$0	$0	$0	
26.2	**Pbar Acceptance - Steve Werkema**	**$1,794,960**	**$1,870,960**	**($76,000)**	
26.2.1	Lithium Lens Upgrades	$471,000	$463,000	$8,000	
26.2.2	AP2 and Debuncher Acceptance	$1,323,960	$1,407,960	($84,000)	Improved plan
26.3	**Pbar Stacking and Cooling - Paul Derwent**	**$3,871,998**	**$2,256,000**	**$1,615,998**	
26.3.1	Stacking and Cooling Integration	$0	$0	$0	
26.3.2	Debuncher Cooling	$0	$0	$0	
26.3.3	Stacktail Cooling	$1,004,000	$1,171,000	($167,000)	Droppped Betatron
26.3.4	Recycler Stacking and Cooling	$774,998	$0	$774,998	Recycler upgrade
26.3.5	Electron Cooling	$1,556,000	$568,000	$988,000	Re-est and re-plan
26.3.6	Rapid Transfers	$537,000	$517,000	$20,000	
26.4	**Tevatron High Luminosity - Vladimir Shiltsev**	**$5,327,968**	**$5,103,000**	**$224,968**	
26.4.1	Tevatron Task Force	$0	$0	$0	
26.4.2	Beam-beam Limitations	$5,000	$5,000	$0	
26.4.3	Active Beam-Beam Compensation	$1,250,000	$1,380,000	($130,000)	Dropped Wires
26.4.4	Increased Helix Separation	$1,488,500	$1,847,000	($358,500)	Mini Separators
26.4.5	Luminosity Leveling	$0	$0	$0	
26.4.6	Improved Control and Diagnostics	$2,213,468	$1,500,000	$713,468	Tev BPM
26.4.7	Tevatron Vacuum Improvements	$90,000	$90,000	$0	
26.4.8	Tevatron Alignment	$281,000	$281,000	$0	

change requests

cost, schedule, scope…

Change Control

From the draft document

Run II Luminosity Upgrade Change Control Thresholds	Fermilab Director, Run II Accelerator PMG	Run II Upgrade Project Manager
Technical	Changes that affect ES&H requirements. Out-of-scope changes to upgrade collider capabilities or impact accelerator systems.	Changes that do not affect ES&H requirements and do not affect upgrade upgrade scope.
Cost	Any increase by $ 100 K or assignment of contingency of $ 100 K to upgrade.	Draw on contingency up to assigned $ 100 K level (cumulative).
Schedule	Any change in the upgrade critical path or a primary milestone by more than 1 month.	Any change in a critical path for a sub-system or a lower level milestone by more that 1 month.
Personnel	Any increase in required FNAL personnel of 10 % relative to the Cost & Schedule Plan	Any change in Level 2 subproject personal of 10% for the year.

Table 3 Benchmark Change Control Levels**.**