



SC-IPC First Report

- **Overview of Executive Summary**

October 20, 2004

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Generating the Report

- **Guidance to Working Group Leaders**
 - ◆ **Develop Timeline/Effort Schedule for Install Technical Commission Physics Commission: "return detector to pre-shutdown capability (or better)"**
 - ▲ **Effort Accountancy: Knowledgeable Expert**
 - ▲ **Use Spaulding 8/04 BD Schedule to Estimate Luminosity Costs**
 - ◆ **Itemize Necessary Infrastructure Jobs needed beforehand**
 - ▲ **Silicon, Trigger Hardware**
 - ▲ **Software**
 - ◆ **Note any testing/certification not possible until item is installed in Detector**
 - ◆ **Account for dependencies on other Upgrade elements**

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Features of the Report

- Upgrade Project Managers checked Report for duplication (& omissions!)
 - ◆ Trigsim most complex
- Specific Recommendations from 3 Working Groups
 - ◆ Task Leaders for Trigger, L0 Software, L1Cal Commissioning
- No "Show-stoppers" but lots of dedicated effort needed
 - ◆ Schedule for L1Cal Hardware slipping behind Layer Zero?
- By assumption, all upgrades installed during single (e.g. 2005) Tevatron shutdown
- (Fully Loaded MS Project Plan correlated to Report)

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Contents of First Report

- First Report Contents
 - ◆ 1. Introduction & Charge
 - ◆ 2. Working Groups:
 - ▲ 1: L2CalTrig (Johns)
 - ▲ 2: L1CalTrak & CTT (Grunendahl)
 - ▲ 3: L2Beta & STT (Hirosky)
 - ▲ 4: TrigSim (Hays)
 - ▲ 5: Layer Zero (Quinn)
 - ▲ 6: AFE II – not yet
 - ▲ 7: Online – not needed
 - ◆ 3. Executive Summary
 - ◆ 4. Detailed Reports of the Working Groups
 - ◆ 5. References
 - ◆ 6. Spokes Charge to the SC-IPC
 - ◆ 7. Descriptions of the Upgrades

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Overview of Executive Summary

- **Executive Summary of the Executive Summary**
 - ♦ Upgrade Hardware (esp rescoped L1CTT, L1Cal Test Area) in "better shape" than software
 - ♦ Hardware "Dates of Completion" taken as input parameters to schedule; Plan indicates L1CalTrig can be installed in time-shadow of Layer Zero (both installation durations mean recorded luminosity is zero)
 - ♦ Effort schedules do not identify which persons will come from Upgrade Project, which are already scheduled to work (e.g. via MOU), and which must be newly recruited
 - ♦ Layer Zero and L1Cal Trig can be installed in 10-week TeVatron Shutdown
 - ♦ First L1Cal Triggers to TFW at week 8; week 12 first global data-taking; week 20 ready for physics

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Overview of Executive Summary

- **Executive Summary of the Executive Summary (cont)**
 - ♦ L1CTT functional at week 12, L1CalTrak at week 13; both doing physics at week 21
 - ♦ Layer Zero data to DAQ at week 11, fully certified for physics at week 17; generates no luminosity cost even if delayed
 - ♦ L2STT fully integrated at week 21
 - ♦ During penultimate last 2 weeks, luminosity cost 50% due to special runs
 - ♦ During ultimate last 2 weeks, luminosity cost 25% due to special runs
 - ♦ Luminosity Cost 122 pb⁻¹
 - ♦ Effort: 465 Physicist-weeks over 21 weeks

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Overall Installation Timeline

Upgrade Physicist Effort and Luminosity Cost Timeline																							
Task Name	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	Wk13	Wk14	Wk15	Wk16	Wk17	Wk18	Wk19	Wk20	Wk21	Totals	
Tevatron Shutdown	[Red bar]										[Red bar]												
Upgrade Activity	Install Hardware										Technical Commissioning						Physics Commission						
Layer Zero Silicon	[Blue bar]										[Red bar]						[Green bar]						
L1 Cal Trig	[Blue bar]										[Red bar]						[Green bar]						
L1 CTT	[Blue bar]										[Red bar]						[Green bar]						
L1 CalTrak	[Blue bar]										[Red bar]						[Green bar]						
L2 Beta	[Blue bar]										[Red bar]						[Green bar]						
L2 STT	[Blue bar]										[Red bar]						[Green bar]						
Trigger List	[Blue bar]										[Red bar]						[Green bar]						
Integrated Luminosity*	0	0	0	0	0	0	0	0	0	0	8	18	30	43	58	75	92	111	131	151	172		
Runlib Upgrade Cost	0	0	0	0	0	0	0	0	0	0	8	18	30	43	58	75	92	102	112	117	122		
Fermilab Physicists	3	6	2	5	5	5	2	1	1	3	1	1	0	0	0	0	0	0	0	0	0	33	
University Physicists	1	5	5	7	5	5	4	4	3	3	3	6	5	5	5	5	2	2	2	2	2	82	
Physicists	14	14	10	6	6	12	20	20	16	16	12	16	15	15	10	23	23	25	31	19	19	350	
Total	18	25	17	17	16	22	26	25	20	22	16	23	20	20	23	28	25	27	33	21	21	463	

* J. Spaulding, BD, 8/04 Design, 10wk shutdown

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Overview of Executive Summary

- Executive Summary of the Executive Summary (cont)
 - ◆ Infrastructure (i.e. pre 2005) effort: 140 PM
 - ▲ Layer Zero Offline Software: 25
 - ▲ L1Cal Precommissioning: 23
 - ▲ L1CTT/L1CalTrak software & Precommissioning: 21
 - ▲ Trigsim software: 69
 - ◆ These are INCREMENTAL to the Upgrade Project

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- **L1Cal Trig – Hardware DOC July 1, 2005**
 - ◆ “The SC-IPC recommends that the collaboration identify a position (or 2) which will be responsible for the oversight and coordination of the L1CalTrig precommissioning effort (hardware & software)...”
 - ◆ “The SC-IPC recommends that shifts taken at the test area be managed as D0 shifts...”
 - ▲ TFW off only 1--2 days at beginning
 - ▲ Global data-taking resumes at week 13
 - ▲ Physics data-taking resumes at week 20
 - ◆ Full-system precommissioning on sidewalk may pace shutdown schedule...

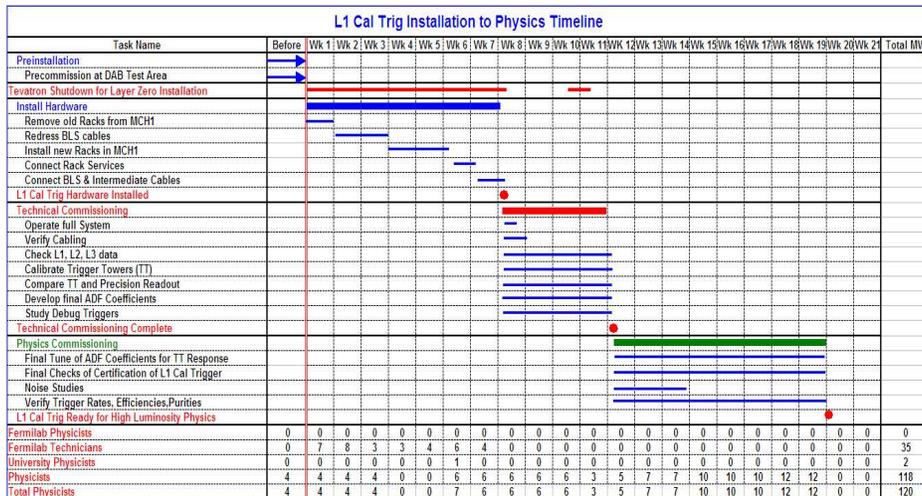
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L1 Cal Trig



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- **L1CTT & L1CalTrack – Hardware DOC May 23, 2005**
 - ◆ L1CalTrak substantially installed & precommissioned before shutdown
 - ◆ L1CTT substantially precommissioned before shutdown so technical commissioning complete at week 12
 - ◆ L1CalTrak physics commissioning resumes when L1CalTrig and L1 CTT ready (week 14)
 - ◆ Both systems ready for physics at week 21

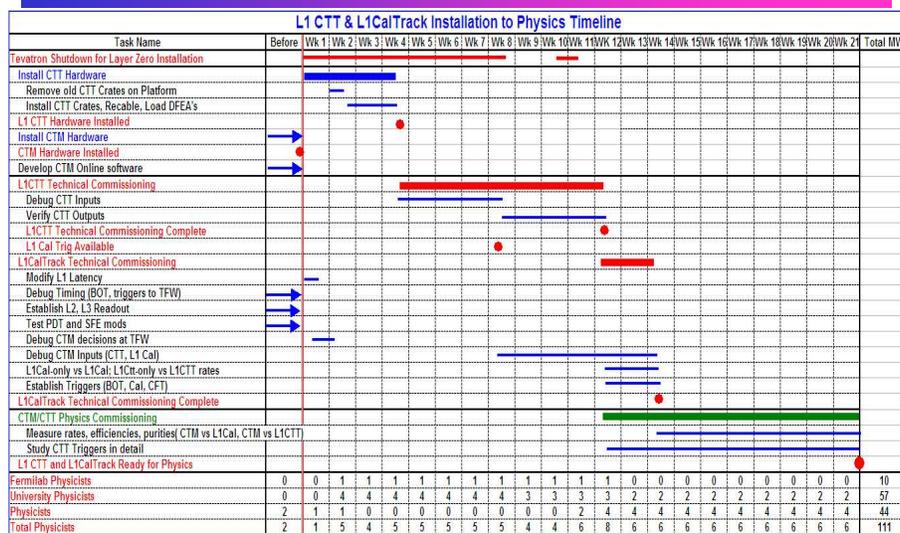
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L1CTT & L1CalTrack



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- **L2Beta & STT – Hardware DOC March 24, 2005**
 - ◆ **L2Beta Processors installed “adiabatically” before shutdown**
 - ▲ L2 Bit Expansion also preinstalled
 - ▲ L1CalTrig data format change installed as L1CalTrig becomes operational
 - ◆ **Splitters and fibers for STT preinstalled in MCH before shutdown**
 - ▲ New hardware installed at beginning of shutdown
 - ▲ Data flow from Layer Zero, L1CTT initiates commissioning
 - ◆ **Both systems fully physics-ready at week 21**

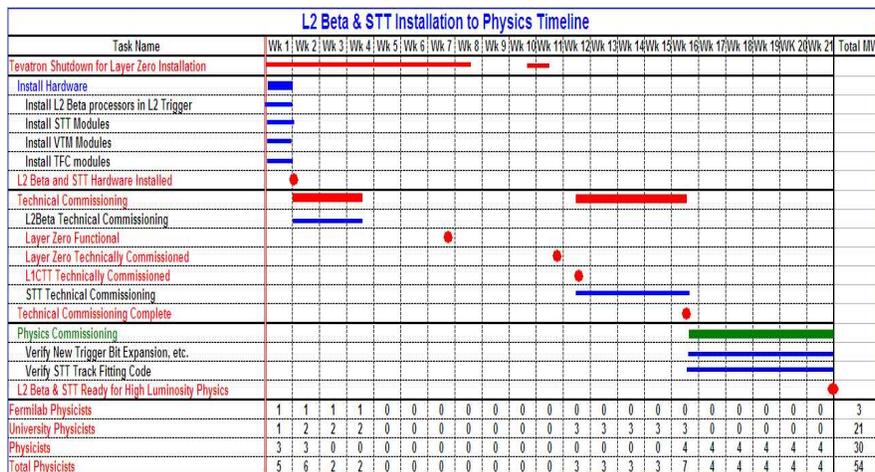
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L2Beta & STT



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- **Trigsim & Trigger List – DOC Nov 1, 2005**
 - ◆ **DOC driven by assumed 2005 Shutdown date**
 - ▲ **Schedule “worked back” from that date**
 - ▲ **Upgrade Project lays critical foundation for Upgrade Integration, “strawman” trigger list**
 - ▲ **“Not a moment to lose”**
 - ◆ **“The SC-IPC recommends that the collaboration identify a position which will be responsible for the integration of the RunIIB trigger effort in the overall D0 trigger strategy...”**

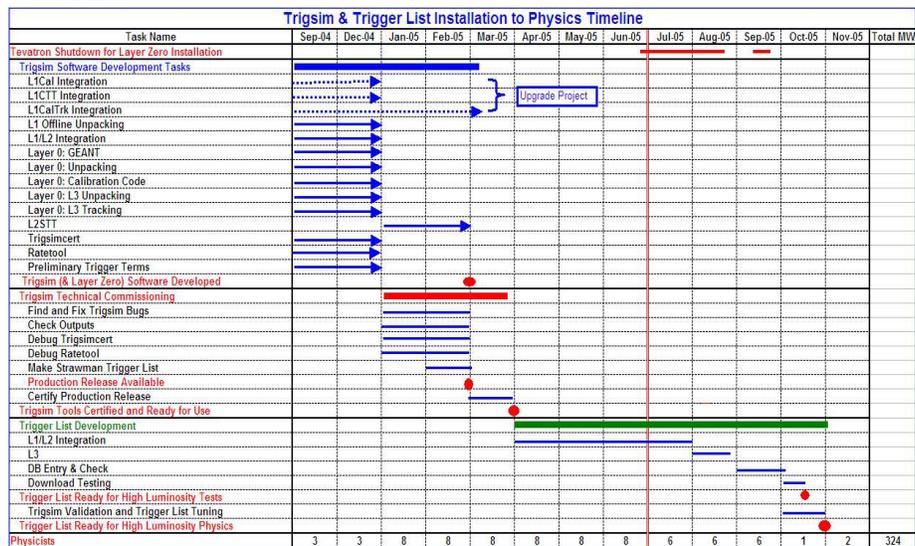
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Trigsim & Trigger List



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- **Layer Zero – Hardware DOC July 21, 2005**
 - ◆ “The SC-IPC recommends that the collaboration identify a position which will be responsible for the oversight and coordination of the Layer Zero software effort...”
 - ▲ Access to Detector Requires 8–10 weeks
 - ▲ Technical commissioning complete at week 12
 - ▲ Physics commissioning complete at week 16
 - ▲ Not needed for physics resumption, so no luminosity cost if physics commissioning delayed

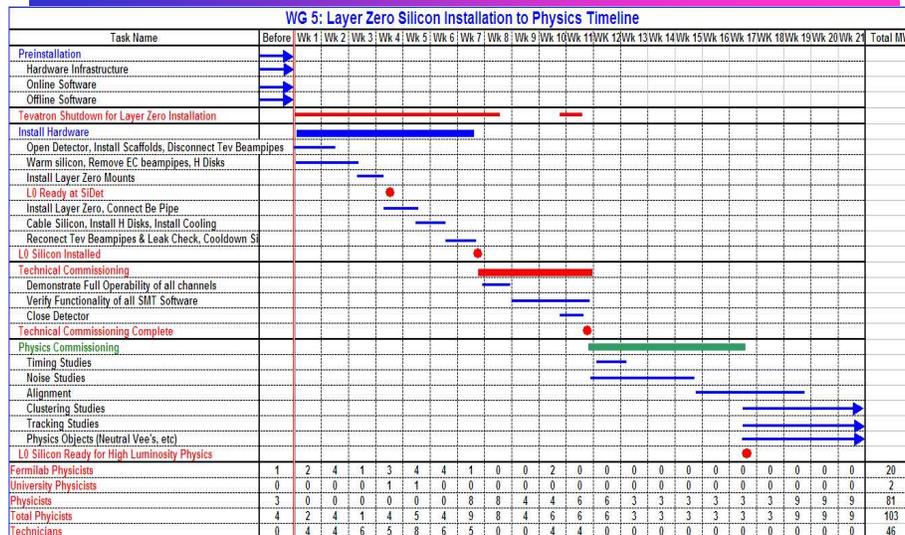
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Layer Zero



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