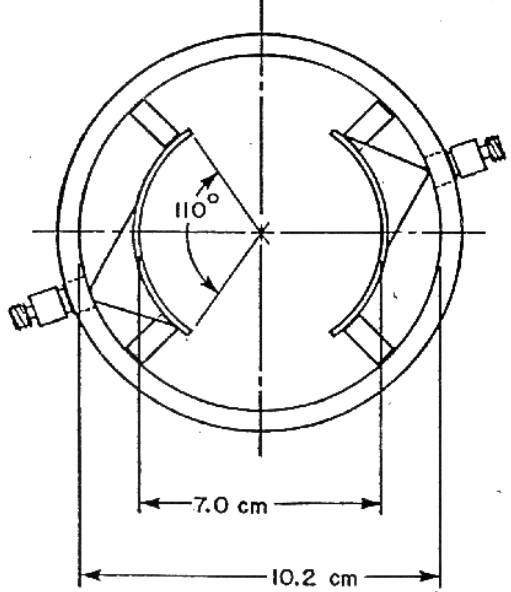


Tevatron BPM Upgrade

Stephen Wolbers

CD Accelerator Coordination Meeting

September 21, 2004

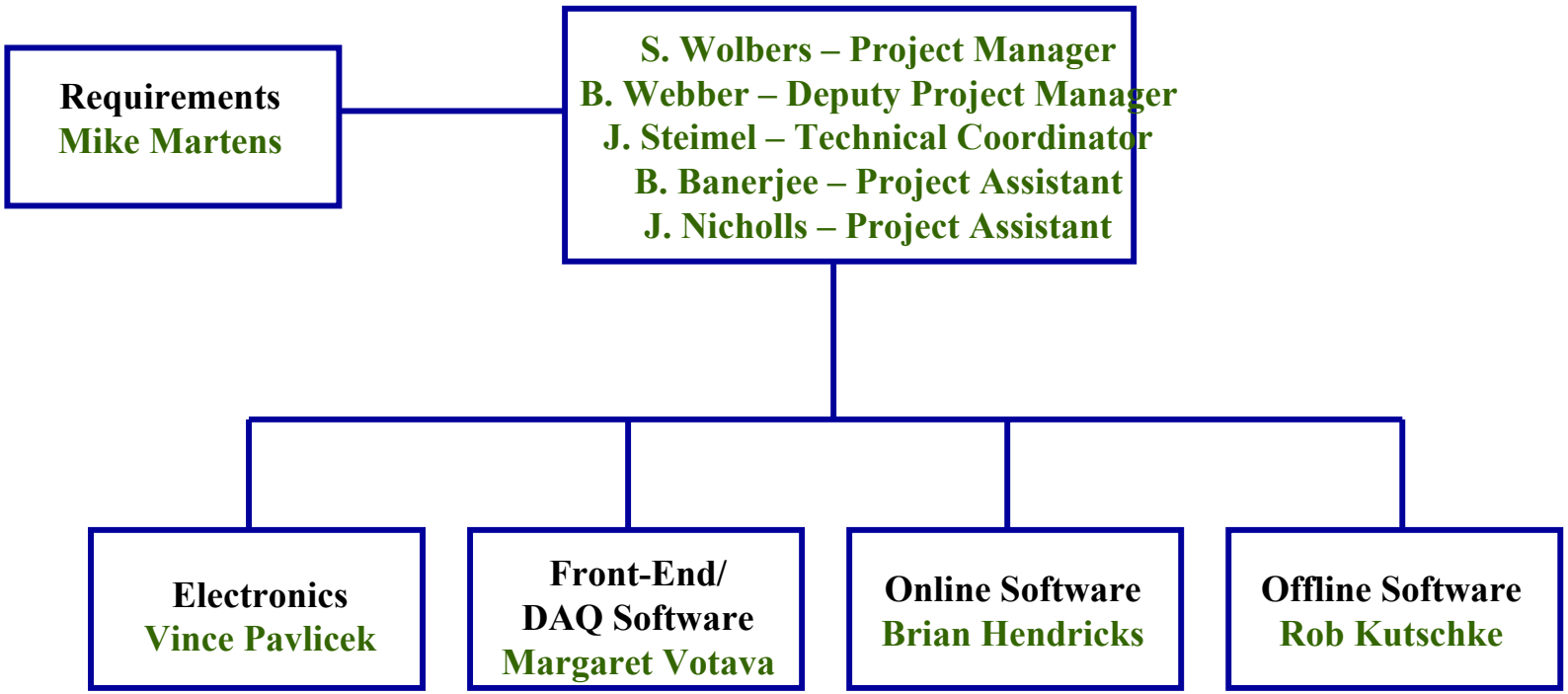
Outline of this talk

- Introduction (last update was 8/3/04)
- Recent accomplishments
- Schedule
- Issues and concerns
- Summary

Reminder: What is to be delivered by the TeV BPM Upgrade project?

- All new electronics.
- Front-end software.
- Data to the online/controls system.
- Mods to applications to use the new data.
- The pickups in the accelerator will not be modified!

Tev BPM Upgrade Project Organization (no changes)



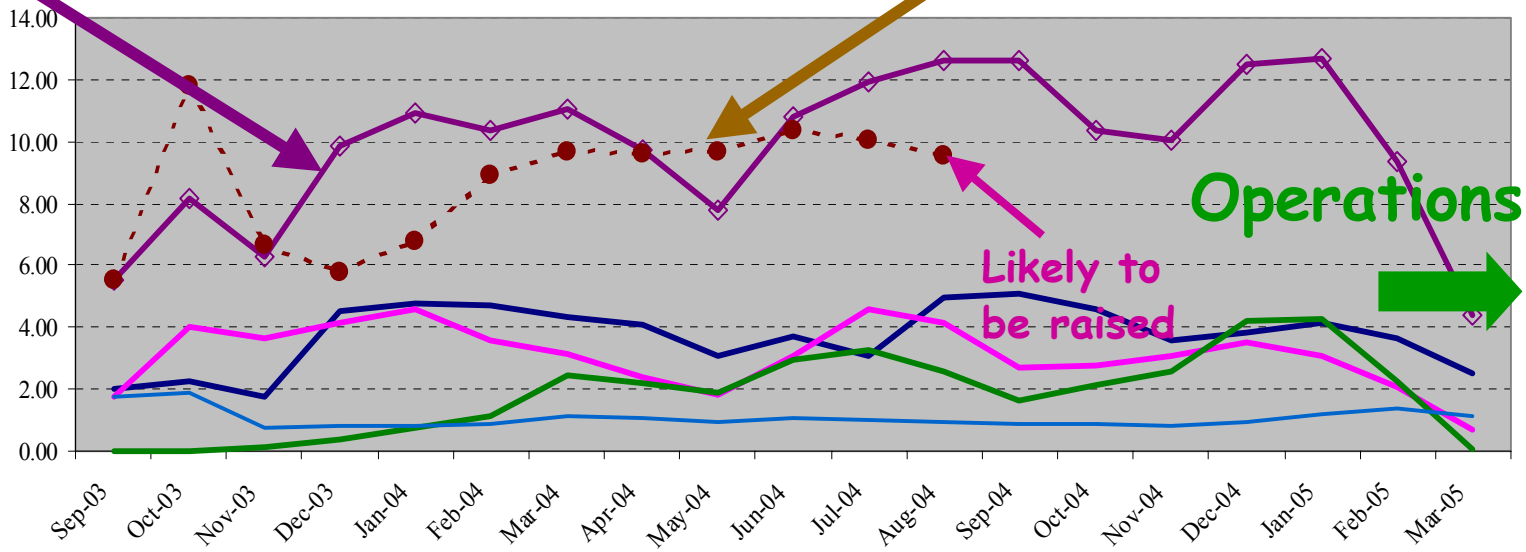
Project Planning - Cost

- Updated Totals (not including overhead and contingency)
  - M&S: $1.76 Million (Same as December 2003 estimate)
  - SWF: $1.41 Million <- Rising as the project time stretches
    - Combination of CD and AD effort, costed to their respective organizations.

RECENT UPDATE

FTE Required

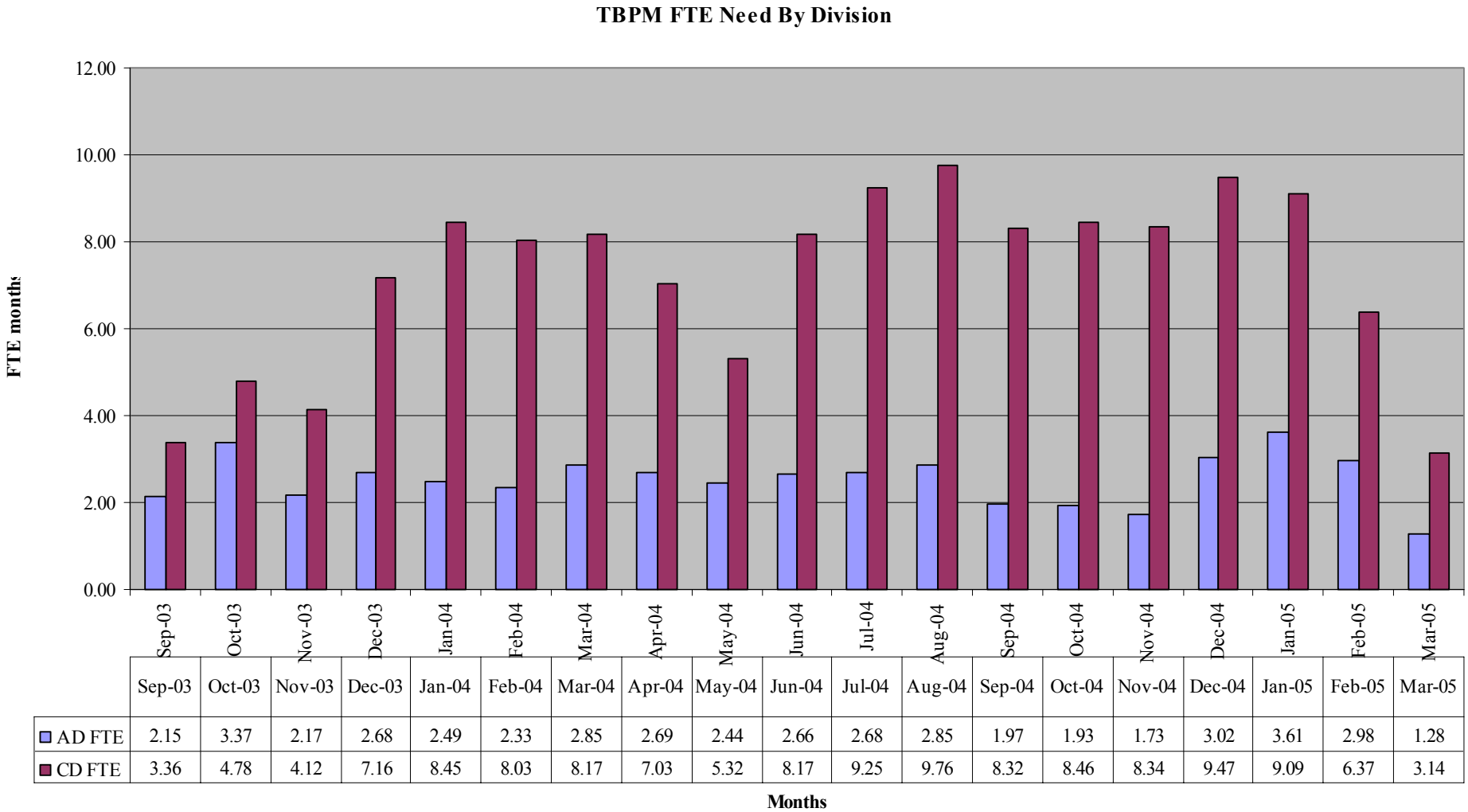
FTE worked



	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05
CP FTE	2.01	2.23	1.79	4.49	4.79	4.74	4.34	4.05	3.09	3.71	3.08	4.94	5.07	4.57	3.56	3.85	4.17	3.64	2.52
EE FTE	1.78	4.03	3.65	4.12	4.58	3.61	3.13	2.38	1.79	3.10	4.58	4.13	2.67	2.79	3.09	3.55	3.08	2.05	0.68
ET FTE	0.00	0.00	0.11	0.39	0.74	1.12	2.44	2.22	1.91	2.96	3.27	2.59	1.65	2.17	2.59	4.18	4.28	2.28	0.08
PHY FTE	1.73	1.89	0.75	0.84	0.84	0.90	1.12	1.07	0.97	1.06	0.99	0.95	0.90	0.87	0.83	0.93	1.18	1.38	1.15
FTE	5.51	8.15	6.29	9.84	10.95	10.36	11.02	9.72	7.77	10.83	11.93	12.61	12.61	10.39	10.06	12.49	12.70	9.35	4.43
Actual FTE Charged	5.5	11.78	6.66	5.76	6.77	8.93	9.66	9.62	9.64	10.34	10.02	9.52							

Months

FTE by Division



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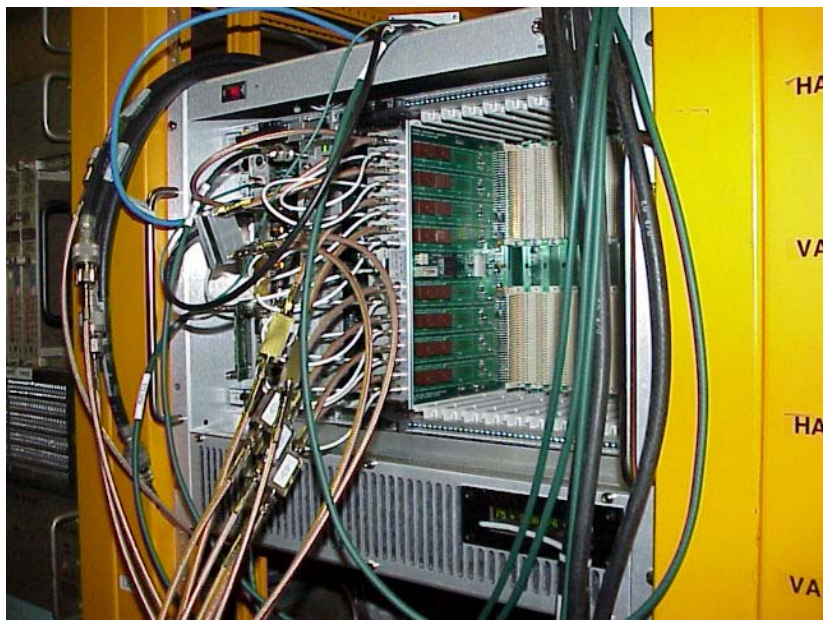
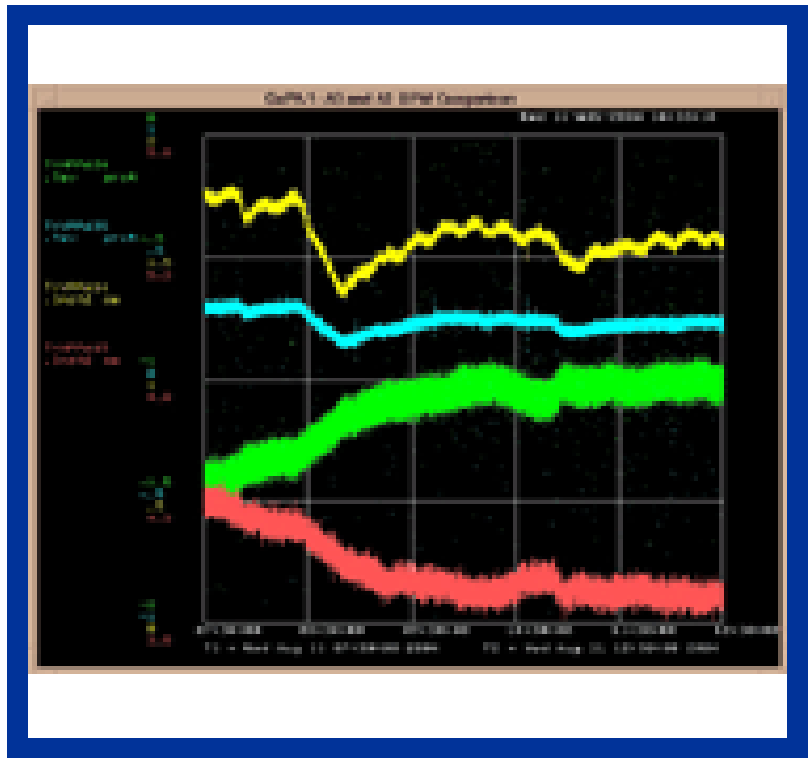
AD FTE	2.15	3.37	2.17	2.68	2.49	2.33	2.85	2.69	2.44	2.66	2.68	2.85	1.97	1.93	1.73	3.02	3.61	2.98	1.28
CD FTE	3.36	4.78	4.12	7.16	8.45	8.03	8.17	7.03	5.32	8.17	9.25	9.76	8.32	8.46	8.34	9.47	9.09	6.37	3.14

Recent Accomplishments

- Measurements in the Beam, prior to the shutdown. Huge success!





Recent Accomplishments

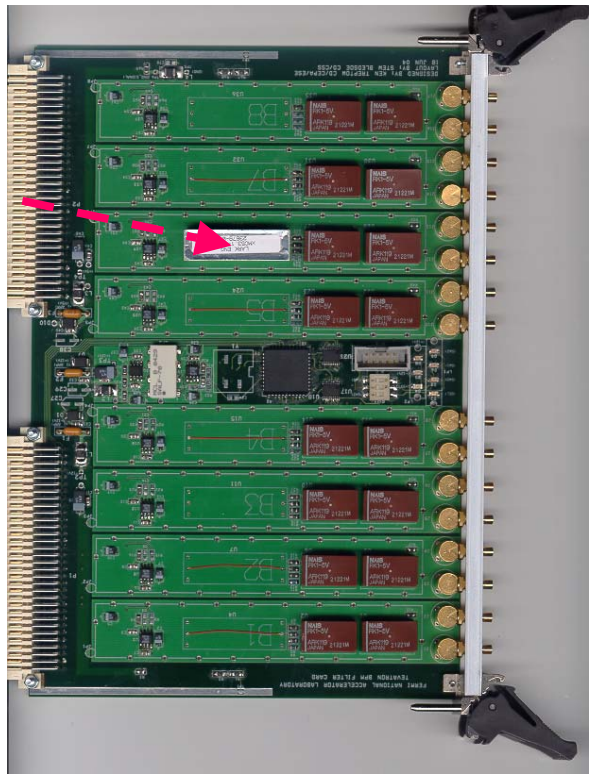
- **Echotek Boards:**
  - Modified Boards arrived August 20, 2004
    - Second iteration, first iteration in June
  - Validated September 3, 2004.
  - Order and final paperwork went to Echotek September 7, 2004.
  - Big Step: 150 boards, >$1M, heart of the system.
  - Many people pitched in and made this possible.
  - Need a plan to tag, track, test, install, all 150 boards.
  - Delivery Schedule is now known: All boards expected by early November!

Recent Accomplishments

- **Timing Board:**
  - 5 Prototypes are being built.
  - Debugged and ready for production.
  - Some (~10) extra boards may be built for the transfer line BPMs.
    - Simpler version of the board.
  - Need to build, test, install 31 boards (+ a few spares).

Recent Accomplishments

- **Filters**
  - Filters are arriving!
  - Need to test (all or some random sample)
  - 1200 filters total
- **Filter Boards**
  - Ready for production
  - Will need to test 150 boards



Recent Accomplishments

- Prototypes/test stands
  - Upgrading/building as many teststands as necessary.
- Service Building preparation
  - Final cable moves and extensions will occur during the shutdown.
  - B0 and D0 BPMs are somewhat different
    - This requires some coordination with Tevatron Dept and CDF/D0.
- Purchases
  - Close to the end on major purchases.

Schedule

- **Shutdown**
  - Plan to install many of the 27 crates during the shutdown.
  - There is space in the racks.
  - We have VME crates, MVME processors, filters. Plan to have timing boards, cables, most filter boards, Echotek boards, panels.
  - We will make adjustments and will probably finish installation after the shutdown ends.

Schedule

- **Commissioning**
  - The system will be commissioned house by house after the beam returns in late November, 2004.
  - Can't commission during the shutdown- the accelerator needs the old BPM system to bring up the beam.

Schedule

- End of Project
  - Commission the full system.
  - Document and hand over to operations.
    - Formal close-outs are planned.
  - MOU's to specify the long-term operation.
    - Hardware (in CD/AD for final comment)
    - Software (close to CD/AD for comment)
  - The long-term support is not part of the project.

Issues

- **Deliveries**
  - Hardware deliveries are in some cases running late. We need to adjust our planning for installation and commissioning.
- **Echotek/front-end/online processing**
  - We are working on a "baseline" for the system for commissioning. Still some thinking/simulation/test stand work required.
  - Antiproton measurements are also an issue.
  - Gustavo Cancelo and Eric James are both helping to address the issue.
  - The number of Echotek boards that are needed by the project may be affected by the final processing scheme.

Issues

- **People**
  - The project needs about 10 FTE through March, 2004.
    - Technicians
    - Computer Professionals
    - Engineers
    - Physicists
  - After March – will need to define the end of the project and transfer effort to operations.
    - Not sure how many FTE that will be.
    - The MOUs are meant to cover this as this is a CD/AD operational issue.

Issues

- Other projects
  - Transfer line BPM
    - Will use same Echotek boards
      - Makes sense to test them in CD
    - Will use a variant of the timing board
      - Still working out the details
    - VME crates – using the same crates
  - MI BPM
    - Same Echotek boards
    - See Bob's talk for other issues.

Summary

- The Tevatron BPM Upgrade is moving forward thanks to the hard and dedicated work of many people in CD and AD.
- We have reached an exciting part of the project where we integrate and commission the system.
- The plan is to finish in early 2005.