

Second Monthly Report of the MI BPM Upgrade
August, 2005
wbs item 1.1.3.2 of the Run 2 Luminosity Upgrade Project
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Project Definition:

The MI BPM Upgrade will replace the current BPM electronics and the data acquisition system used to transfer information between the BPMs and the Accelerator Controls Systems. As part of the project, the software used to read out, transfer, store, and analyze the BPM data will be upgraded. The goal of the project is to provide a BPM system based on modern hardware and software that gives the higher resolution and expanded functionality necessary to efficiently understand and operate the Main Injector now and for the foreseeable future including the needs for Run 2 and NUMI. Deliverables of the project include all relevant documentation, manuals, user's guides and any other written records necessary for maintaining the system.

Project Manager's Summary:

The final report from the July 25 requirements review was received this month. The report recommends that the project finalize and clarify the requirements so that detailed design can proceed. The project recognizes the issue and is working to finish the requirements and to move into design wherever possible. No design work at the moment is impacted by not having all of the final requirements. However, the final requirements document is important for the long-term and will be a high priority.

In August progress was made on many parts of the project. The combiner boards went into production and should all be delivered by the end of August or early September. Plans will be made to install them in the MI tunnel. Detailed plans will depend on the shutdown or shutdowns schedule, which should be known soon.

Effort was made to understand which VME subrack should be purchased for the project. Experience of the TeV BPM Dawn crates has been used to help update the specifications. The project plans to go forward to acquire the necessary subracks.

MVME processors were investigated to decide which model should be acquired for the project. Considerations include the support lifetime of the particular model, memory available, experience at the lab, etc. The 2400, 5500 and 6100 models are all under consideration.

Progress continues on the transition board prototype. The first prototype, a 2 channel analog only board, should be complete by the end of August. The next version (the "pre-series"), a full 8 channel board including the I/O control, should be designed by mid-September with layout coming directly after. Testing of the first prototype will begin immediately.

Many people were involved working to provide MI BPM clock signals to the FCC3 test stand. Accelerator Division and Computing Division Networking, Controls, and MI BPM project members were all involved in the discussions to come up with a workable solution. Most of the work was completed by the end of August. A quiet time with all accelerators off is needed to make the final connections and to make the signals available in FCC3.

A test stand at MI30 has been used to test some of the concepts needed for the MI BPM upgrade, including using 4 channels of the Graychip DDC in the Echotek boards, testing the quality of the measurements available using 2.5 MHz and 53 MHz components of the beam, testing a modified TeV BPM timing board, etc. These tests will continue and may branch out to include prototype MI BPM front end software as appropriate and desired.

Work has begun to understand the final electronics position and cabling in the MI service buildings. A full survey of the buildings is being discussed so that many of the long lead time issues can be thought about and resolved long before the actual installation date of the upgraded systems.

Front-end and Online software work continues. Work is focused on how the requirements impact the design of the software and the data structures. At the same time work continues on prototype and first versions of software to be tested in the MI30 test stand or the FCC test stand.

Resources Used in August 2005:

The total time worked on the project in calendar August 2005 from the Computing Division was 2.7 FTE-months with 9 people contributing. The time worked from the Accelerator Division was 1.4 FTE-months with 9 people contributing. The total time worked from both Divisions was 4.1 FTE-months. The following table gives the estimated or reported effort for both divisions (in FTE-months) since July, 2005.

<u>Month</u>	<u>AD Effort</u>	<u>CD Effort</u>	<u>Total Effort</u>
July, 2005	2.1	2.4	4.5
August, 2005	1.4	2.7	4.1
SUM (through Aug, 2005)	3.5	5.1	8.6

The effort listed here is time worked and does not include vacation, sick leave, holidays, etc.

Purchase requisitions/procard obligations through August, 2005:

Name	Req #/PO/Fermi	Item	Cost
MI BPM DDC Electronics Delivery	PO556099	Digital Recievers	\$540,000.00
MI BPM Misc Electronics Delivery Combiner Box (Purchase complete)		Misc.	
Brackets	PO564173		\$2,350.00
	PO# 563823 Req# 180362 June20,2005 Don Rogus		\$6,450.00
	PO# 563823 Req# 180362 June20,2005 Don Rogus		\$6,450.00
	PRN# 64960 Jim Franzen		
	PO# 563836 Req# 180363 June21,2005 GaryGolinski		\$945.00
	PRN# 64958 Jim Franzen		
	PRN# 64956 Jim Franzen		
	PO# 564173 Req# 180559 July11,2005 R. Evans		\$4,712.00
Fabrication	PO564712		
MIBPM Timing Fanout Generator module			\$1,765.00
MIBPM Analog Transition module			
	PRN#66940	Avnet	\$837.50
	PRN#67451	Avnet	
	PRN#66941	Mouser	\$2,350.00
MIBPM Digital Crates			
MIBPM MVME			
Cable etc.			
MIBPM T&M			
Total			\$565,859.50

Milestones:

1.1.3.2.1.2	MI BPM: Review (Milestone)	7/25/2005
1.1.3.2.4.2	All Combiner boxes available	10/25/2005
1.1.3.2.3.1.3.5	Transition module PO issued	1/10/2006
1.1.3.2.6	MI BPM system complete	8/15/2006

Meetings held, Reports Given:

Meetings were held in July on the following dates:

Project Meetings: August 2,9,16,23,30

Documents:

The following documents were written and added to the Accelerator Division Document Database during August, 2005.

[1526-v2 MI BPM Meeting Notes and Minutes Steve Wolbers](#) 31 Aug 2005

[1939-v1 Status Update of Dawn Crate Failures Timothy J. Kasza](#) 23 Aug 2005

[1937-v2 Main Injector BPM Review Committee Report of July 25, 2005 Alan Baumbaugh et. al.](#) 22 Aug 2005

[1914-v3 Tevatron BPM front-end data acquisition cycles Luciano Piccoli](#) 02 Aug 2005

Subproject Leader Reports:

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