Quarterly Report FY09 Q1

Project Name: STAR-TOF Date: January 23, 2009
Contract Project Manager: Geary Eppley

Summary of milestones covered during review period:

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1.1.18 Final design review: Infrastructure. The final mechanical design of the TPC support structure is complete and has been reviewed by mechanical engineers at BNL. A final cost estimate for this structure is expected by the end of January and this review is now planned for early February.

1.3.18 82 trays complete. 94 trays were completed and delivered to BNL. (This milestone was originally 120 trays before the Baseline Change Proposal was approved.)

Summary of expenditures:

(The *Baseline* column includes contingency. *To completion* and *Estimated cost* do not.)

The first spread sheet is the original baseline project budget. The baseline cost is $4.8M in actual-year dollars including contingency.

WBS		Baseline	To date	To completion	Estimated cost	Contingency	%
		(amounts in k$)					
1.3.1	Tray	534		445	445	89	20
1.3.2	Gas system	70		61	61	9	15
1.3.3	High voltage system	142		121	121	21	17
1.3.4	Start detector	31		28	28	3	11
1.3.5	Infrastructure	84		65	65	19	29
1.4.1	Board purchase and testing	2683		2111	2111	572	27
1.4.2	System testing and integration	296		228	228	68	30
1.4.3	Electronics installation	253		202	202	51	25
1.4.5	Low voltage system	259		233	233	26	11
1.4.6	Electronics design	171		134	134	37	28
1.1.1	Project management	261		249	249	12	5
1.2.1	China Coordination	16		15	15	1	7
1	**Project Total**	**4800**		**3892**	**3892**	**908**	**23**

The following spread sheet reflects the project status at the end of FY09 Q1.

WBS	Baseline (amounts in k$)	To date	To completion	Estimated cost	Est. Contin.	%
1.3.1 Tray	534	410	101	511		
1.3.2 Gas system	70	57	11	68		
1.3.3 High voltage system	142	167	15	182		
1.3.4 Start detector	31	4	23	27		
1.3.5 Infrastructure	84	16	49	65		
1.4.1 Board purchase and testing	2683	2151	171	2322		
1.4.2 System testing and integration	296	180	168	348		
1.4.3 Electronics installation	253	135	70	205		
1.4.5 Low voltage system	259	187	11	198		
1.4.6 Electronics design	171	229	0	229		
1.1.1 Project management	261	363	60	423		
1.2.1 China Coordination	16	23	0	23		
1 Project Total	**4800**	**3922**	**679**	**4601**	**199**	**29**

There are no issues that have occurred in the project since the cost was re-estimated in July and a Baseline Change Proposal was approved in August that indicate a need to increase the estimated cost to complete the project. None of the contingency of $199 thousand approved in the Baseline Change Proposal has been used and this amount remains adequate at this stage of the project.

- Summary of expenditures (in k$):
  Note: The table below shows cumulative amounts from the inception of the project, by fiscal year.

	FY 2007	FY 2008	FY 2009
A) Funds allocated:	4800	4800	4800
B) Costs accrued:	2274	3735	3922
C) Commitments less accrued costs:			625
D) Remaining contingency:			199
E) Uncommitted funds (e=a-b-c)			253

- Summary of schedule: (Note actual vs. forecast date)

	Baseline Start Date mo/year (a)	Actual/ Forecast Start Date mo/year (b)	Baseline Completion Date mo/year (c)	Actual/ Forecast Complete Date mo/year (d)	% Compl. Actual (e)
Design	02/06	05/06	10/06	09/07	100
Procurement	03/06	04/06	02/08	12/08	100
Construction	08/06	05/07	12/08	09/09	65
Operation					

Brief summary of project issues, concerns, successes:

MRPC status: The China project delivered 60 spare MRPCs to UT Austin to replace any that fail QA testing at UT. There are more than 100 spares remaining in China, but no expected need to use them.

Electronics production: All electronics production, including spares, is complete. A few boards have been returned to Blue Sky Electronics and Blue Sky will either repair or replace these boards. Blue Sky plans to complete testing of a few remaining TDIG and TCPU boards in their inventory and sell them to the project.

All six THUB trigger-DAQ interface units are complete. Four are installed at BNL for Run 9. Two spare units will remain at UT for testing during the run.

Tray production: A cumulative total of 94 TOF trays were delivered to BNL by mid-November for installation for Run 9. An additional 9 trays are now fully tested and ready for shipment from UT. UT expects to complete assembly and testing of 120 trays and 6 spares by the end of April.

Installation: All 94 trays at BNL are now fully installed. Two of the 56 trays on the west side of STAR apparently lost their low-voltage connection when the west pole-tip was closed and will not be available for Run 9. The TCPU card on one tray out of 38 on the east side was determined to have a bad component after it was installed and that tray will not be used in Run 9. Of the remaining 91 trays, there are still only 2 dead channels out of 17472 channels. The start detectors have been outfitted with new high-voltage bases for the PMTs, to reduce ringing. The start detectors and the electronics are now re-installed in STAR. We are testing the full, installed TOF system by turning on high-voltage and low-voltage several times a week and reading out data through STAR DAQ and run control. We will be able to compute noise rates for all channels from this data. This exercise tests the interface to STAR trigger and DAQ, as well as the full TOF system. We will run this test about 2 times a week from now through the end of Run 9. The scheduled start date for cryogenic operations at RHIC is still February 1.

High-voltage cables: The remaining high-voltage cables that will be required to complete the TOF installation for Run 10 are being repaired at UCLA.

Gas system: The TOF re-circulating gas system was designed by PNPI in Russia and purchased by BNL. The system was largely installed last spring. Two scientists from PNPI scheduled a one-month trip to BNL in October to commission the system and train personnel at BNL in its operation. After the PNPI scientists returned to Russia, we discovered that we are not able to operate the gas system in re-circulation mode. We are purging gas through the system and we can in principle operate this way for Run 9. The operating cost is about $1k/week.

We would like to operate the TOF gas re-circulating system in Run 9. The PNPI group has designed most of the gas systems at STAR and PHENIX and trained personnel at BNL in the normal operation of these systems. The PNPI expert is not confident, however that there is anyone at BNL that is sufficiently expert to be able to set up a new system that is not already properly adjusted. In trying to operate the TOF gas system, the adjustments that had been set by the PNPI experts were changed. We would like to invite the experts from PNPI to return to BNL during Run 9 to train personnel and commission the system. We are trying to identify someone at BNL to train to take over the operation of this system.

Noise rates: The following chart shows the noise rates for 22 of the TOF trays installed at BNL. The x-axis is tray number. The green points are rates for the highest-rate channel in each tray. The blue points are rates for the lowest. The black points are the tray average noise rate per channel. As can be seen, no channel is above the project specification of <50 Hz, and the average rate is quite low. The data was analyzed and the plot prepared by M. Wada, a student at UT Austin. An independent analysis was prepared by J. Liu at Rice with the same result.