

# QUARTERLY REPORT FORM

Report Date: 24 May 2004	U. S. DOE Project Manager's Progress Report	Office of Science
Project Number: n/a	Title: U.S. LHC Accelerator Construction Project	Program: High Energy Physics
Report Period: 2 <sup>nd</sup> Quarter FY2004	Location: Fermilab (Host Lab)	Project Office: CH Fermi Area Office

## SUMMARY ASSESSMENT

	<u>Current Quarter</u>	<u>Previous Quarter</u>
Cost:	Minor Concern	Minor Concern
Schedule:	Satisfactory	Satisfactory
Technical:	Satisfactory	Satisfactory
Overall:	Satisfactory	Satisfactory

## PROJECT MANAGEMENT

DOE Program Managers:	Moishe Pripstein	Phone: 301-903-4115
	Bruce Strauss	Phone: 301-903-3705
DOE Project Manager:	Pepin Carolan	Phone: 630-840-2227
Contractor Manager:	Jim Strait	Phone: 630-840-2826

## FUNDING (\$K)

	<u>Baseline</u>	<u>Current Est.</u>	<u>Funding</u>
DOE TPC	110,000	110,000	107,079
NON DOE	0	0	0
Total	110,000	110,000	107,079

## CRITICAL DECISIONS

Number	Title	<u>Baseline</u>	<u>Actual/Forecast</u>
CD-1	Approve Mission Need	12/97	12/97 (A)
CD-2	Approve Baselines	10/98	10/98 (A)
CD-3	Start Construction	12/97	12/97 (A)
CD-4	Construction Complete	09/05	09/05 (F)

## FUNDING PROFILE/COSTS

### Per FY 2003 Budget (\$M)

	<u>Prior</u>	<u>FY 04</u>	<u>FY 05</u>	<u>Total</u>
DOE TPC	100.95	6.13	2.92	110.00
CERN Direct <sup>2</sup>	49.06	23.2	17.74	90.00
Total	150.01	29.33	20.66	200.00

### Cumulative through 03/31/04 (\$K)

Remaining Contingency	2,234
Contingency/Remaining Costs <sup>1</sup>	31%
Costs Accrued	101,901
Open Commitments	0

<sup>1</sup> Percentage calculation: Remaining Contingency divided by Remaining Costs where Remaining Costs = Budget at Completion - Budgeted Cost of Work Performed.

<sup>2</sup> U.S. contributions to the LHC machine includes the \$110 million for the U.S. LHC Accelerator Project and \$90 million for CERN purchases from U.S. industrial suppliers.

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## SCHEDULE SUMMARY

<u>Milestones Accomplished Since Last Report</u>	<u>Baseline Date</u>	<u>Actual Date</u>
• Complete absorber fabrication	Apr 03	Jan 04
• D3 dipole cooling specification and interface specification approved	Mar 02	Feb 04

<u>Key Milestones Upcoming (Next Three Months)</u>	<u>Baseline Date</u>	<u>Forecast Date</u>
• First Q2 quadrupole shipped to CERN	Mar 03	Jun 04

## NARRATIVE HIGHLIGHTS

As of March 31, 2004, the overall project was 93% complete versus the scheduled plan of 95% complete. Overall technical progress remains good with all major items in production. Contingency based on the EAC continues to be reduced to address engineering change requests, and this remains a concern that is being closely monitored and carefully managed by the project. The schedule of deliverables is slightly behind plans, but in advance of CERN requirements. Project highlights are listed below:

- [Fermilab] The review of fabrication and test results for the first Q2 quadrupole was completed and the magnet was prepared for shipment to CERN. Shipment is expected next quarter. The fourth Q2 was successfully tested and removed from the test facility. The first Q1, containing a KEK cold mass, was moved to the test stand. Testing is planned for next quarter with KEK in attendance.
- [BNL] The first three of nine D2 dipoles arrived at CERN. The next three are ready for shipment and will be sent next quarter. The final three are complete and are being prepared for shipment. The first of three D3 dipoles has been assembled and is in the queue for testing. The other two are close behind. The first of three D4 magnets has been tested and the second is on the test stand. Superconducting cable testing continues to be paced by the rate of sample deliveries from CERN: 228 samples were tested this quarter, the highest of any quarter thus far.
- [LBNL] The four TAN absorber assemblies arrived at CERN (the four TAS absorbers arrived last quarter). The cryogenic feedbox schedule has slipped approximately 5 weeks due to the need for a redesign of the internal supports for the helium vessel. This was completed and vendor has progressed to installing the first set of HTS power leads and vapor cooled corrector leads. All GFE supplied subassemblies, bus ducts and beam tubes from LBNL and instrumentation ducts from Fermilab, have been supplied to the feedbox vendor.

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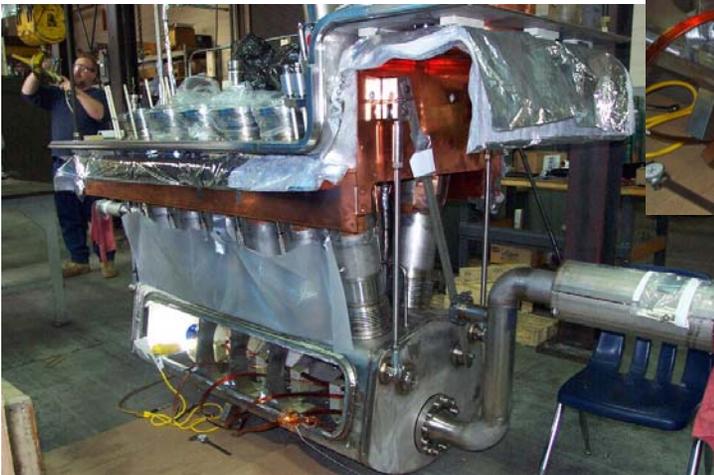
Above – Q2 quadrupole. Magnet is on the shipping frame awaiting final approvals before crating and shipping to CERN.



Above – TAN absorber being shipped to CERN.



Right – D2 dipole in container ready for shipment to CERN.



Above – DFBX helium vessel mounted to underside of top plate. HTS power leads and corrector leads are being installed.



Above – Splicing HTS leads inside the DFBX helium vessel.



Right – First D3 dipole installed in its cryostat.

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## BACKUP INFORMATION

### Baseline Documents

1. U.S. - CERN Agreement and the Accelerator and Experiments Protocols - approved 12/97 by the DOE Secretary and NSF Director.
2. DOE/NSF Memorandum of Understanding on LHC, approved 6/98, revised 12/99, by M. Krebs, DOE, and R. Eisenstein, NSF.
3. U.S. LHC Project Execution Plan - rev1 approved 10/02, rev0 approved 12/98 by J. O'Fallon, DOE, and J. Lightbody, NSF.
4. U.S. LHC Accelerator Project Management Plan - approved 10/98, by J. O'Fallon, DOE, and J. Lightbody, NSF.

### Alternate Cost Status Report (earned value) as of March 31, 2004 (\$K)

WBS Item	Contractor <sup>4</sup>	Task Description	Cumulative to Date			At Completion <sup>3</sup>		
			BCWS	BCWP	ACWP	Budget	Contractor Estimate	Project Mgr. Estimate
1.1		Interaction Region Components	60,441	58,282	59,033	63,159	63,753	63,753
1.2		RF Straight Section	15,642	15,549	14,506	15,865	14,659	14,659
1.3		Superconducting Wire and Cable	10,441	10,451	10,331	11,912	11,222	11,222
1.4		Accelerator Physics	3,359	3,359	3,288	3,359	3,359	3,359
1.5		Project Management	12,906	12,906	14,744	13,472	15,666	15,666
		Contingency				2,234	1,341	1,341
		U.S. LHC Accelerator Total	102,789	100,547	101,901	110,000	110,000	110,000

### Change Control Activity (01/01/04 – 03/31/04)

<u>Baseline Control Level</u>	<u>Change Control Authority</u>	<u># of Changes</u>
Level 0	DOE - Director, Office of Science/NSF -Associate Director for Mathematical and Physical Sciences	None
Level 1	DOE/NSF Joint Oversight Group	None
Level 2	DOE/NSF Project Office	Two*
Level 3	U.S. LHC Accelerator Project Office	None

- BCR-61: Extend bottom heat shields on D3 dipoles approximately 570 mm at the lead end to enable CERN to more easily attach their newly designed QQS interface module.
- BCR-62: LBNL to provide cost and schedule analysis support to Fermilab.

<sup>3</sup> At completion estimates for the WBS Level 2 elements include G&A and overhead charges for the three laboratories. These costs are tracked separately.

<sup>4</sup> The U.S. LHC Accelerator Project includes Fermilab, Brookhaven National Laboratory, and Lawrence Berkeley National Laboratory. Fermilab is the lead laboratory.