October 12, 2001

Dr. Robert J. Weggel
Physics Department, Bldg. 901A
Brookhaven National Laboratory
Upton, NY 11973-5000

Subj: Budgetary cost estimate for a 15 Tesla pulsed, liquid nitrogen cooled coil and cryostat.

Dear Bob,

Upon your request, we have prepared a budgetary cost estimate for the design, fabrication and testing of a resistive 15 Tesla, pulsed, liquid nitrogen-cooled coil and cryostat.

We have broken the cost estimate into two parts; a cost estimate for industrial fabrication of the coil and cryostat, shown in Table 1, and a cost estimate for MIT effort shown in Table 2. We have further divided the MIT effort into 3 phases, a design phase, a fabrication oversight phase, and a testing phase. Under the testing phase, after fabrication completion the coil would be shipped to MIT and tested here using MIT power supplies to the full 15 Tesla central field rating. The coil would then be shipped to BNL and MIT personnel would participate in installation and start-up there.

The costs, in summary, would be approximately $90K-$100K for the coil fabrication and approximately $200K to MIT for design ($85K), fabrication supervision ($55K), and for testing and installation ($60K).

Please consider these cost as budgetary estimates only. They are not to be considered an official MIT offer. If you decide to proceed with this project then we would make a formal offer through MIT's Office of Sponsored programs and give a detailed work statement and budget description.

Please feel free to contact me for any other information.

Sincerely,

Dr. Joseph V. Minervini,
Senior Research Engineer and Division Head

Table 1. Cost estimate for industry fabrication of pulsed copper coil and liquid nitrogen cryostat.

	Cost ($1000)
Materials - Dies (2) - Conductor - Kapton - Fiberglass	 4 15 7 2
Tooling	10
**Labor	38
Cryostat (Fiberglass)	15
Total	**91**

* Conductor estimate: 1300 turns, total length of 833 meter, 1,020 Kgs = 2,236 lbs (used 1000 meter for estimate)

** Labor estimate: 1300 turns total
average of 20 turns winding per day
average of 65 days, at 5 days per week equals 13 weeks,
or 520 hours, at $60/hour equals to $31.2 K
estimating one week of setup time $2.4 K
Plus two weeks of impregnation $4.8 K
Adds up to $38.4K rounded off to $38K

Contingency not included: recommend 10% or $9K

Table 2. Budgetary estimate for design, fabrication supervision, and testing and installation of pulsed copper magnets

January 2, 2002 - October 31, 2002

	Person-Months			Funds			
	Phase One Magnet Design	Phase Two Fabr. Supervision	Phase Three Acceptance Testing	Phase One	Phase Two	Phase Three	Summa
ENGINEERING PERSONNEL	3.2	2.54	1.7	$48,500	$37,000	$22,000	$107,5
OTHER PERSONNEL							
Designers	2.9	0	0	$26,000	$0	$0	$26,0
Technicians	0	0	2	$0	$0	$18,000	$18,0
Other(Allocated Admin. Support)				$5,000	$4,000	$4,000	$13,0
TOTAL OTHER PERSONNEL				$31,000	$4,000	$22,000	$57,0
TOTAL SALARIES, WAGES & FRINGE BENEFITS				$79,500	$41,000	$44,000	$164,5
TRAVEL							
1. Domestic				$2,400	$13,000	$5,200	$20,6
OTHER COSTS							
1. Materials and Supplies				$800	$300	$750	$1,8
2. Liquid Nitrogen				$0	$0	$5,000	$5,0
3. Computer Services				$2,000	$450	$1,000	$3,4
4. Electrical Components				$0	$0	$2,000	$2,0
5. Mechanical Components				$0	$0	$1,800	$1,8
6. Other: Allocated Lab Expense				$300	$250	$250	$8
TOTAL OTHER DIRECT COSTS				$3,100	$1,000	$10,800	$14,9
TOTAL COSTS of PROJECT				$85,000	$55,000	$60,000	$200,0

Notes:

1) All costs are fully loaded
2) Phase I duration: 4 Months, Jan. 2, 2002 - April 30, 2002
3) Phase II duration: May 1, 2002 - August 31, 2002