

From: F. Cavanna and J. Raaf  
 To: S. Geer  
 Subject:  
 reply to question:

In the MOU (dated Sept 25) there is a summary of costs table in which most of the Fermilab costs are "tbd". Do we have estimates for any of these yet ?

Source of Funds [\$K]	Materials & Services	Labor Technicians + Engineers (person-weeks)
Particle Physics Division	(1) \$ 180 k	90
Accelerator Division	0 k	(2) 26
Computing Sector	(3) 12 k	0
ES&H Section	(4) 10 k	0
Totals Fermilab	\$ 202 k	116
Totals Non-Fermilab	\$ 150 k (US Groups) \$ 23 k (non US Groups)	9 (Ext. Company) 6 (non US Mech. WS)

(1) PPD - This corresponds to (MoU, p.22):

4.2.3 Engineering and technical manpower will be provided by FNAL PPD together with a financial support, for DESIGN, MODIFICATIONS AND INSTALLATION OF specific cryogenics parts of the experimental layout (New Recirculation System, Filling Station, Filter Activation/Regeneration, Beam Window-Ti Flange).

However, cryogens (LN2) consumption for cooling during run operations and LAr for initial filling were NOT accounted for in the table included in the MoU. The cryogens consumption depends entirely on the design of the cryogenic system, not yet defined at this stage.

- A preliminary estimate (upper level) for the cryogens consumption is \$ 5 k/month ⇒ \$ 60 k assuming 1 yr of continuous running (again, an upper limit).

- LAr for filling: \$ 5 k.

In conclusion, \$ 65 k should be added to the list (PPD funds? contributions from University Groups?)

(2) AD - This corresponds to (MoU, p.22):

4.1.6 The test beam energy and beam line elements will be under the control of the AD Operations Department Main Control Room (MCR). [0.5 person/week]

However, this is a generic estimate usually included, but realistically it should be closer to 0 person/week [as indicated by A. Soha].

(3) CD - This corresponds to (MoU, p.17):

2.5.4 Off-line data storage 30 TB disk space (BlueArc storage disks for ready access and also ENSTORE tape for permanent storage).

We have estimated this item as follows:

- BlueArc: 30TB (=\$9000)
- Tape (permanent) storage: 20TB (=\$2000)
- 4-core virtual machine: \$1000

Total: \$12k

(4) ES&H - This corresponds to (MoU, p.20):

4. *Venting system and ODH sensors.*

We estimate this item as \$ 10 k (including ODH fan, and piping for venting and ODH sensors and alarms). This is a very generic estimate (we don't know yet what will be required).