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Date: **10/20/10**

TECHNICAL NOTE



MICE Spectrometer Solenoid: Schedule, Budget and Manpower

1. Introduction

The schedule, budget and manpower required to complete the Spectrometer Solenoid Project have been estimated and are presented here. Note that these are preliminary and are dependent on the approval of the magnet modification plan by MICE technical management as well as agreement with the vendor on the scope of modifications and the associated schedule. The details of these items along with the relevant assumptions are presented below.

2. Schedule

A schedule has been assembled based on experience with assembly with the previous versions of the magnet and is shown in Figure 1. Some aspects of this schedule will depend on the final scope of modifications undertaken as well as the willingness of the vendor to dedicate the appropriate resources. Preliminary schedule discussions with the vendor have indicated that they are preparing to hire additional technical help to complete the Spectrometer Solenoids as well as other of their projects. The schedule will also depend on how quickly the modification plan can be approved by the technical committee. The schedule presented assumes that some aspects of the modification plan can be approved early such that the reassembly of the magnets is not delayed further.

3. Budget

An estimate of the remaining costs to LBNL to complete the Spectrometer Solenoids has been compiled and is presented in Table 1. The costs include both LBNL manpower and hardware as described below:

Manpower tasks

- system analysis
- design for modifications
- assembly oversight
- project management
- magnet commissioning
- project documentation

Hardware

- additional cryocooler purchase
- cost of contract modifications for added scope
- utility and cryogen costs for magnet training
- shipping costs

4. Manpower

The manpower required to carry out the tasks listed above has been identified and is available. The total effort listed in the budget currently amounts to slightly more than one man-year. The bulk of the effort will be for monitoring the assembly process and for carrying out the magnet training and commissioning.

The following individuals will be responsible for completing the specified tasks. Although not listed here, some additional help from FNAL may be available during magnet training (as has occurred in the past).

Steve Virostek - Sr. Mechanical Engineer

- overall project management
- some oversight of magnet assembly
- magnet training oversight
- documentation

Tapio Niinikoski - Sr. Cryogenic Engineer

- CERN retiree, currently being hired 1/2 time by LBNL
- magnet design analysis
- design modification recommendations
- some oversight of magnet assembly
- magnet training oversight

Nanyang Li - Mechanical Engineer

- continuous oversight of magnet assembly
- magnet training oversight
- documentation

Soren Prestemon - Cryogenic Engineer

- magnet design analysis
- design modification recommendations
- occasional oversight of magnet assembly

Sisi Shan - Mechanical Engineering Student

- organization of magnet detail drawings
- development of magnet 3D CAD drawing

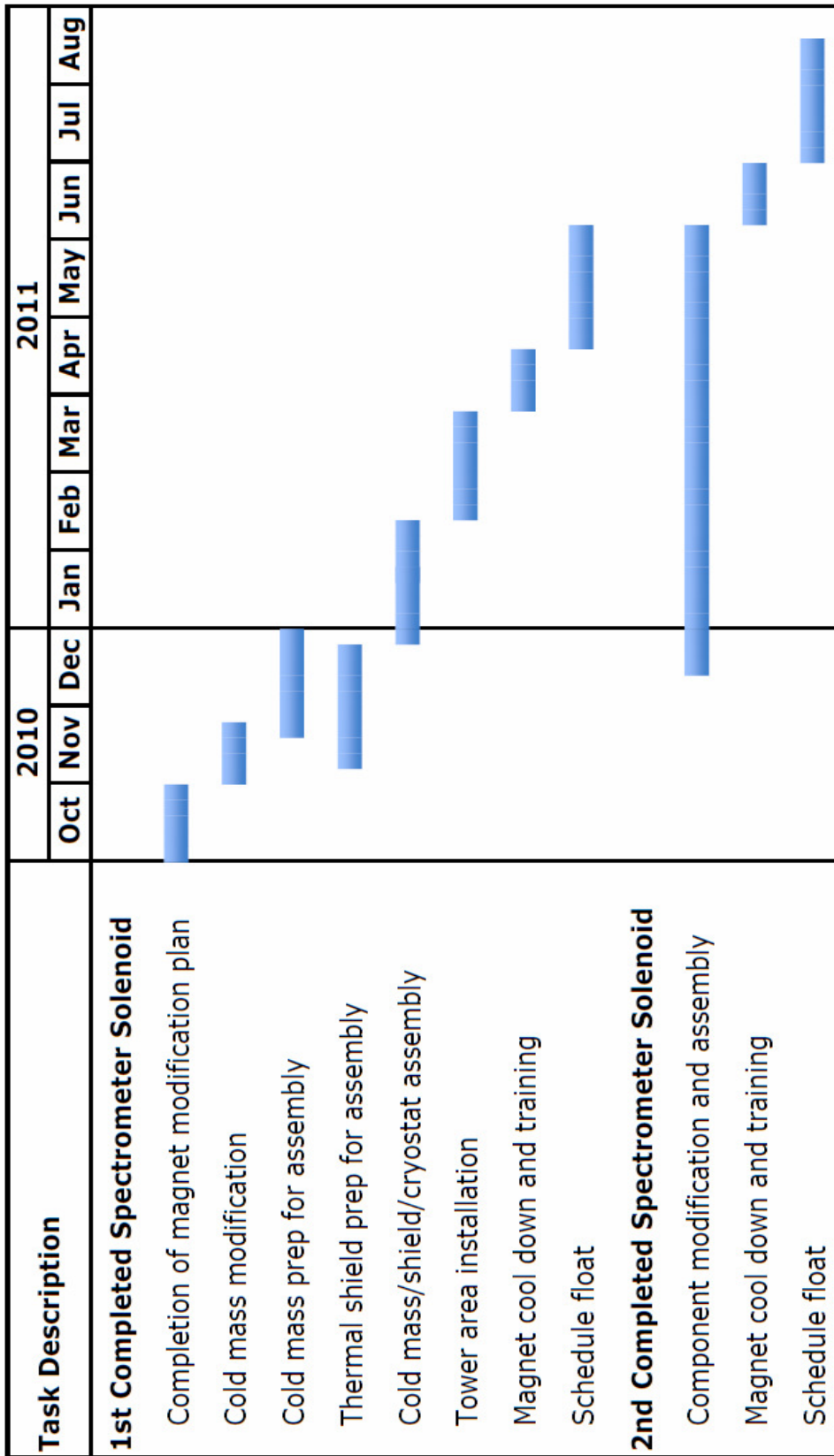


Figure 1: Preliminary magnet reassembly and completion schedule

Manpower	Hours	Type	\$/hr[^]	Total (k\$)
Analysis	280	Cryo Engr	160	45
Design Mods	280	Cryo Engr	160	45
Management	350	Sr Mech Engr	200	70
Fab Oversight	350	Sr Cryo Engr	140	49
Fab Oversight	420	Mech Engr	150	63
Testing/Training	140	Sr Mech Engr	200	28
Testing/Training	140	Mech Engr	150	21
Commissioning @ RAL	170	Mech Engr	150	26
Documentation	140	Sr Mech Engr	200	28
Documentation	140	Mech Engr	150	21
Fab/Procurement	Qty	Unit	\$k/ea	Total (k\$)
Cryocoolers (PT415)	1	ea	53	53
Contract Mods	2	magnets	25	50
Training Utilities	2	magnets	21	42
Training Cryogens	2	magnets	20	40
Shipping to FNAL	2	ea	5	10
Shipping to RAL	2	ea	10	20

Spectrometer Solenoid Totals: 610
Contingency: 173
Total with Contingency: **\$783k**

[^] fully burdened LBNL rates

Table 1: Spectrometer Solenoid estimated cost to complete.