FY07 ILC Statement of Work – WBS 3.10.9 Reference Design and Project Support

This proposal is to complete the conceptual engineering and design of the large crossing angle insertion region final focus magnet system, provide cost estimate information and also support project management for the BNL ILC activities. It appears conceivable at this time that the baseline design may change from a 20 mrad crossing angle to a 14 mrad one. The WBS element will produce any necessary changes in this regard. Support for MDI efforts are also included in this work package.

A cryostatted magnet structure shall be engineered and designed to the configuration of the full insertion region. This structure shall have all the magnetic elements, with suitable coils and support structures. In so far as possible the magnet structure shall accommodate the detector elements in this region as well as the other machine components. This system shall include features for independent adjustment of each element, and shall also include the sub-cooled helium cryogenic heat exchanger needed for maintaining the operating temperature of 1.8K. This work then understandably will guide the activities of the prototype design and construction within the limits of funding. The FY07 activities will be comprised of the engineering and design tasks of the magnet system.

Project management activities will guide the BNL efforts and also provide support for activities related to the ILC MAC. This effort is estimated at 0.1 FTE's

Work to be Accomplished in FY07

We will complete the engineering and design of the accelerator magnet system, including conceptual design of the power leads and the cryogenic heat exchanger. Text, figures and cost information for the RDR will be generated in support of the GDE machine baseline reference design. A detailed conceptual design of the final focus region with crude detector interfaces will be developed.

Attendance at 2 or 3 ILC MAC meetings will be supported.

Relevance to the FY07 goals of the ILC Global Design Effort

This work is being conducted in support of the Conceptual Design Report (CDR) on the Insertion Region Magnet System for the ILC. This magnet system is situated in a very constricted region due to the proximity to the detector and the small crossing angle. In addition, due to the external heating the system is required to operate at 1.8K, thereby complicating the cooling requirements. Much careful engineering analysis and mechanical design is need to properly support the Conceptual Design Report and the associated costing of the magnet system.

Key Milestones/Personnel

magnet system engineering and design complete	Sep 07
power lead and cryogenic system conceptual design complete	Sep 07
WBS work package leader	Michael Anerella
Lead mechanical engineer	Andrew Marone
Lead cryogenic engineer	K. C. Wu

FY07 Deliverables

Magnet system engineering; mechanical models, structural, heat load and vibration analyses
Cryogenic heat exchanger engineering
Cost Information
RDR input as necessary

Cost

Labor FTE's	Labor $K Direct	M&S $K Direct	Indirect costs $K		Total Costs $K
0.9	120	10	100		230

Labor consists of 0.4 FTE mech eng, 0.4 FTE cryo eng, 0.1 FTE mgmt