NCSX June 2007 ETC
TABLE I - DESIGN LABOR

WBS Number: 21
WBS Title: Gas Fueling System
Job Number: 2101
Job Title: Fueling System
Job Manager: Bill Blanchard

Description:

The proposed fueling system consists of a gas delivery from a single gas cylinder and a gas injection portion consisting of one piezo electric pulse valve, one manual interface valve located at one of the upper P12 port covers. The pulse valve will be operated by a valve driver controlled by the NCSX computer system (greater than 50 T-l/sec fueling rate).

Task ID	K$	Hours									Basis of Estimate
		EMEM	EMSM	EMSB	EMTB	EASB	EEEM	EESM	EESB	EETB	
Title I and II Design											**This is a relatively simple system that utilizes some existing parts/components already at PPPL. Estimate based on prior experience on similar systems (e.g., NSTX), adjusted for the simplicity of this system. Includes some P&ID drawings, weld drawings, fabrication drawings, two reviews (PDR & FDR) and installation and test procedures. Input from experienced engineers/personnel familiar with specific parts of this scope was used for estimates. Includes overall design and oversight, design activities (dwgs, support and bracket design, overall configuration of the system) and purchasing of components.**
Pro-E models (avg)											
assy dwgs											
Detail drawings											
installation dwg											
designer oversight											
electrical schematic											
I&C schematic											
stress analysis											
thermal analysis											
special analysis (electromagnetics)											
Procurement Specifications											
preliminary and final design reviews											
Subtotal Title I & II Design	***$5K***	***120***	***0***	***96***	***64***	***32***	***0***	***96***	***0***	***0***	***M&S included function generator/valve driver (~$3K) + miscellaneous***
Title III		***40***									**This effort includes fabrication/welding/assembly, installation, oversight, leak checking of the subsystems, procedures, and initial operation and testing.**
Subtotal Title III	***$0K***	***40***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	