

**NCSX June 2007 ETC
TABLE II - Materials and Subcontracts**

WBS Number: 135														
WBS Title: Central Solenoid Support Structure														
Job Number: 1353														
Job Title: CS Support Structure Procurements														
Job Manager: Fred Dahlgren														
Materials and Subcontracts (M&S)													Basis of Estimate	
Description:														
This effort covers manufacturing of the interim central solenoid support structure and integration of the PF1aU&L, with the structure. The pieces of structure are procured via one or more fixed price contracts. This structure is for MIE day-1 operations using the old salvaged PF coils from NSTX. A new structure will be necessary for operations with the baseline PF1,2&3 coils.														
Purchased parts:														
upper and lower interface hub	\$123,488	see notes below											Includes Material surcharge as of May'07	
brackets to TF structure	\$23,400												Includes Material surcharge as of May'07	
spacers and tie rods	\$25,072												Includes Material surcharge as of May'07	
<i>subtotal, purchased parts</i>	\$171,960													
outside engr rate =	130	\$ per hour											Not used in this estimate - build to print	
outside fab rate =	92	\$ per hour											Based on SLAC internal rate & web survey	
outside inspection/technician rate =	75	\$ per hour											Based on Lab shop rate & web survey	
Worksheet:														
Center solenoid upperr interface hub														
Fabrication / parts costs														
Item / description		Value		Unit		Cost \$/unit		No.		Cost \$				
Center hub Weldment		92		lbs		28		1		\$2,576			Based on similar parts fabr. cost	
Upper solenoid hub weldment Assy		236		lbs		28		1		\$6,608			Based on similar parts fabr. cost	
Machining of upper hub weldments, 2 setups		64		hrs		92		1		\$5,888			Based on Lab Shop estimate	
Inspection		8		hrs		75		1		\$600			Based on Lab Shop estimate	
Insulation and shims between weldments		1		interface		1500		12		\$18,000			Based on similar parts fabr. cost	
misc bolts and assembly hardware-upper		1		lot		10000		1		\$10,000			Based on B&G quote for Inconel 718 h'dware - See Table V	
lower solenoid hub weldment Assy		236		lbs		28		1		\$6,608			Based on similar parts fabr. cost	
Machining of lower hub weldments, 2 setups		64		hrs		92		6		\$35,328			Based on Lab Shop estimate	
Inspection		8		hrs		75		6		\$3,600			Based on Lab Shop estimate	
Insulation and shims between castings		1		interface		1500		12		\$18,000			Based on similar parts fabr. cost	
misc bolts and assembly hardware-lower		1		lot		10000		1		\$10,000			Based on B&G quote for Inconel 718 h'dware - See Table V	
Package & Shipping										\$5,000			Based on past experience on similar projects	
										\$107,208				
Material Surcharges & delta: 316L - Inconel 601		564		lbs		20				\$11,280			Based on Huntington verbal Quote for Inconel 601	
													Adjusted Total	
										\$123,488				
Brackets to TF structure														
Fabrication / parts costs														
Item / description		Value		Unit		Cost \$/unit		No.		Cost \$				
Upper tie plate to TF coil structure		500		lbs		8		1		\$4,000			Based on similar parts fabr. Cost	
Machining of upper and lower crown segment casting		40		hrs		92		2		\$7,360			Based on Lab Shop estimate	
lower brackets to TF coil structure		30		lbs		8		6		\$1,440			Based on similar parts fabr. Cost	
machining of lower brackets		16		hrs		92		6		\$8,832			Based on Lab Shop estimate	
										\$12,800				
Material Surcharges & delta: 316L - Inconel 601		530		lbs		20				\$10,600			Based on Huntington verbal Quote for Inconel 601	
													Adjusted Total	
										\$23,400				

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Materials and Subcontracts (M&S)							
							Basis of Estimate
Center Solenoid assembly hardware							
Item / Description	Value	Unit	Cost \$/unit	No Units	Cost \$		
1"OD, 96" long Tie Rods	90	lbs	25	6	\$2,262	Based on cost of threaded rod	
G-10 separation discs & misc.	150	lbs	20	7	\$21,000	Based on similar parts fabr. Cost	
		<i>subtotal of assembly hardware</i>			\$23,262		
Material Surcharges & delta: 316L - Inconel 601	90		20		\$1,810	Based on Huntington verbal Quote for Inconel 601	
				Total:	\$25,072		
Center Solenoid PF1a Upper to Lower interconnect							
Bus Fabrication / parts costs							
These estimates are based on prior job experience and quotes received for Inconel hardware from B&G and Solon Washers - Braze alloy-Mcmaster-Carr							
Item / description		lbs/ft.	\$/lb	No. of Units			
Copper OFHC extrusion 3/4"sq. w/.38dia hole	10	1.75	\$4.25	2	\$74.38		
CTD-112 (or equiv.) Epoxy/Glass pre-preg. Insulation 1" rolls		per roll	\$98.00	4	\$392.00		
Bend return & supply bus segments	12	hrs	\$81.00	2	\$1,944.00		
Wrap & cure bus segments	40	hrs	\$81.00	1	\$3,240		
Machine & assemble (braze) LN2 fittings	8	hrs	\$81.00	4	\$2,592.00		
Cut & bend Cu Jumpers	12	hrs	\$81.00	2	\$1,944.00		
Silver-braze & clean-up jumper lead-stem mtg. plates	8	hrs	\$81.00	8	\$5,184.00		
Cut & machine jumper/lead-stem mtg. plates	16	hrs	\$81.00	8	\$10,368.00		
Cut & Machine G11 clamps	12	hrs	\$81.00	3	\$2,916.00		
Hardware B'ville washers -Inconel718			\$38.50	64	\$2,464.00		
Hardware Inconel hex nuts 1/2-13			\$32.00	32	\$1,024.00		
Hardware Inconel 718 hex bolts 1/2-13 x 2"			\$42.00	32	\$1,344.00		
Silver brush plate all bolted bus surfaces			\$20.00	8	\$160.00		
Handy-Harman Silver braze BA9-1 easy-flo-45 filler alloy	5	oz.	\$109.83	1	\$109.83		
		<i>subtotal of assembly hardware</i>			\$33,756.21		
TOTAL JOB 1353					\$205,715.71		
Notes:							
Labor for parts assembly should be in Job 1352							
Labor for installation should be in Machine Assembly Task							