

NCSX Work Approval Form (WAF)

WBS Number: 142

WBS Title: Windings and Assembly

Job Number: 1421

Job Title: Design of Modular Coil Interfaces

Job Manager: David Williamson

Description:

Job 1421 consists of the effort to design the modular coil interfaces, including R&D.

Schedule:

Approvals:

_____	_____
Job Manager	Date
_____	_____
Responsible Line Manager	Date
_____	_____
Project Manager	Date
_____	_____
Engineering Department Head	Date

NCSX June 2007 ETC
 TABLE I - DESIGN LABOR

WBS Number: 142																				
WBS Title: Windings and Assembly																				
Job Number: 1421																				
Job Title: Design of Modular Coil Interfaces																				
Job Manager: David Williamson																				
Welded Joint Tests																				
Procedure																				
INTRF-035	PPPL Determine shim material																			40
INTRF-001	PPPL buy SS plate for weld trials																			8
INTRF-005	Weld distortion trials at PPPL on SS plate																			40
INTRF-025	ORNL build plywood mockup of flange																			140
INTRF-030	ORNL verify weld access, develop alternate welding methods																			40
INTRF-010	Develop Weld Geometry Procedure																			40
Test																				
INTRF-015	Weld trials on two MCWF's at PPPL																			80
INTRF-020	Document results and update weld procedure																			120
Overall interface																				
INTRF-040	Analysis of tensile loads (ORNL)																			320
1421-3134	Develop specs & dwgs for station 2 & 3 assy																			300
1421-3136	Conduct MC interface FDR incl job 1416																			40
1421-3138	Resolve issues, release assembly drawings																			240
FY07 Rebaseline exercise																				
ECP53RBX05	FY07 Rebaseline Exercise																			256
Travel																				
	trips for ORNL personnel to PPPL																			\$9k
	trips for PPPL personnel to UT MDL																			\$3k
	SUBTOTAL																			\$12k
unlisted, known labor hours																				
	scheduled and unscheduled meetings/reporting/presentations (@ 25%)																			1240
	TOTAL																			\$12k
																				6200
																				750

NCSX June 2007 ETC
TABLE II - Materials and Subcontracts

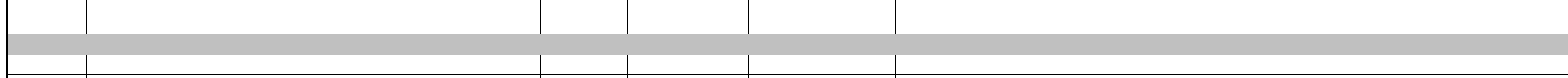
WBS Number: 142				
WBS Title: Windings and Assembly				
Job Number: 1421				
Job Title: Design of Modular Coil Interfaces				
Job Manager:David Williamson				
Materials and Supplies				
			M&S-k\$	
1421-3067	Procure 2 studs f/joint test.Use existing part		\$1k	Based on stud quotation
1421-3112	Test fixture for fatigue testing		\$10k	Based on fabrication estimate for hardware, see detail below
IH1-001	Coil to coil analysis		\$36k	Based engineering judgement for subcontract, see details below
INTRF-001	PPPL buy SS plate for weld trials		\$31k	Based on \$15/lb SS plate, see detail below
INTRF-005	Weld distortion trials at PPPL on SS plate		\$1k	engr judgement for consumables
INTRF-025	ORNL build plywood mockup of flange		\$30k	Based on est costs for subcontract, see detail below
INTRF-030	ORNL verify weld access, develop alternate welding methods		\$20k	Based engineering judgement for subcontract, see details below
	ORNL verify CC bolt reach access		\$19k	Based engineering judgement for subcontract, see details below
INTRF-015	Weld trials on two MCWF's at PPPL		\$1k	engr judgement for consumables
	TOTAL		\$149k	

NCSX June 2007 ETC
TABLE II - Materials and Subcontracts

WBS Number: 142					
WBS Title: Windings and Assembly					
Job Number: 1421					
Job Title: Design of Modular Coil Interfaces					
Job Manager:David Williamson					
Details					
Test fixture for fatigue testing					
SST plate, G11 bushings and insulators material				\$6k	
LN2 can, bellows, support struts, G10 rods				\$4k	see detail bill of matls below
				\$10k	
Analysis subcontract					
12 weeks x 50% time		240	hours	\$36k	
stainless steel plate					
1.5"x 4' x 8' plate @ \$15/lb		2070	lbs	\$31k	
plywood mockup					
plywood, paint, etc.		1	lot	\$3k	
labor, technicians		240	hours	\$18k	2 techs for 3 weeks
labor, supervision		60	hours	\$9k	half time for 3 weeks
total est. for contract				\$30k	
ORNL verify weld access					
weld consumables		1	lot	\$2k	weld wire, gas, etc.
labor, technicians		160	hours	\$12k	2 techs for 2 weeks
labor, supervision		40	hours	\$6k	half time for 2 weeks
total est. for contract				\$20k	
ORNL verify CC bolt access					
wood, glue, etc		1	lot	\$1k	
labor, technicians		160	hours	\$12k	2 techs for 2 weeks
labor, supervision		40	hours	\$6k	half time for 2 weeks
total est. for contract				\$19k	

NCSX June 2007 ETC
TABLE II - Materials and Subcontracts

WBS Number: 142					
WBS Title: Windings and Assembly					
Job Number: 1421					
Job Title: Design of Modular Coil Interfaces					
Job Manager: David Williamson					



Item	Description	Part number	Supplier	quantity	cost/item	Total Price	phone number
Parts List For NSCX Shear testing:							
1	Del Seal CF Flanges - 4-1/2 Inch OD	110018 (Ref# 450000)	MDC	1	\$48.00	\$48.00	800-443-8817
2	4.5 OD half nipple with clearance holes	401004 (Ref# 150-1)	MDC	1	\$110.00	\$110.00	800-443-8818
3	Bellows (2" ID, 4.5" OD)	400005 (Ref# 250-x)	MDC	1	\$330.00	\$330.00	800-443-8819
4	Copper Gasket (4.5" flange)	191009 (Ref# GK-250)	MDC	12	\$24.00	\$288.00	800-443-8820
5	18" X 12" X 18.125" Stainless stell batch can	3763K221	McMaster	1	\$524.53	\$524.53	404 629-6500
6	Semi-Ridgid PVC insulation (low density 3/8")	9318k74	McMaster	4	\$27.42	\$109.68	405 629-6500
7	Vibration Damping Clamps	3015T133	McMaster	6	\$20.56	\$123.36	406 629-6500
8	18-8 Hex Head Cap Screws (4.25" long)	92240A559	McMaster	2	\$21.42	\$42.84	407 629-6500
9*	3" X 1.5" T-slotted Extrusion (cut to 19" long)	unknown	BertleKamp	4	unk	unk	865 588-7691 Wendel Copper
10*	3" X 1.5" T-slotted Extrusion (cut to 20" long)	unknown	BertleKamp	2	unk	unk	866 588-7691 Wendel Copper
9-10 alternative	This part can be orederd from mcmaster as "Aluminum Fractional T-Slotted Framing Sylems" We cut it to size ourselves	47065T138	McMaster	2	\$76.60	\$153.20	407 629-6500
11	G-10/FR4 Rod (3/16" diameter) sold by the foot	8669K23	McMaster	6	\$3.03	\$18.18	408 629-6500
10	1.5" diameter (17-4 PH) stainless precision ground rod (6' long) see if you can get 4 feet long	9095K25	McMaster	1	\$290.81	\$290.81	409 629-6500
11	2.0" diameter 4140 steel rod (12" long)	8935K151	McMaster	1	\$38.81	\$38.81	410 629-6500
12	2.5" diameter 4140 steel rod (12" long)	8935K191	McMaster	1	\$56.15	\$56.15	411 629-6500
13	4-48 NF Tap (Plug) ask Joe/Jim if this is ok for them.	2522A775	McMaster	3	\$4.29	\$12.87	412 629-6500
14	4-48 Socket Cap screws (3/8" long)	91251A836	McMaster	1	\$8.40	\$8.40	413 629-6500
15	Schaevitz LVDT's (GCA-121-125)	2350500	Schaevitz	4	\$365.00	\$1,460.00	800 745-8008
					Total Cost	\$3,614.83	

NCSX June 2007 ETC
TABLE III - Fabrication and Assembly

WBS Number: 142																			
WBS Title: Windings and Assembly																			
Job Number: 1421																			
Job Title: Design of Modular Coil Interfaces																			
Job Manager: David Williamson																			
		FY07SK																	
Task ID	Comments	41MS	48MS	37STK	35TRVL	31OT	EMSM	EMTB	EASB	EEEM	EESM	EESB	EETB	ECEM	ECSB	ECTB	RM2	RM3	Basis of Estimate
Outboard Interface Design																			
I14-020	Prepare outboard shim dwgs and release																		see Table V - Basis of Estimate
INTRF-045	FDR outboard shims																		see Table V - Basis of Estimate
	Resolve CHITs and issue shim drawing																		see Table V - Basis of Estimate
Bolted Joint Tests																			
Tension Tests of Bolted Joint																			
1421-3067	Procure 2 studs f/joint test. Use existing part																		see Table V - Basis of Estimate
1421-3075	Setup test fixture & perform JHA & pre-job brief																		see Table V - Basis of Estimate
1421-3077	Meas joint deflec vs preload & loss of preload																		see Table V - Basis of Estimate
1421-3079	Measure joint deflec & preload v. temp @80K																		see Table V - Basis of Estimate
1421-3084	Measure joint deflection&preload v. cooldown cyc																		see Table V - Basis of Estimate
1421-3087	Perform pullout tests for lapped holes																		see Table V - Basis of Estimate
1421-3081	Meas joint deflect & preload v. time (days) at R																		see Table V - Basis of Estimate
1421-3090	Document&conduct review of test results																		see Table V - Basis of Estimate
Bolt Shear Test at 77K																			
1421-3112B	Procure/fab parts for test&initial assembly																		see Table V - Basis of Estimate
1421-3115B	Assemble & test																		see Table V - Basis of Estimate
1421-3119B	Document test results																		see Table V - Basis of Estimate
Inboard Interface Design																			
I11-001	Coil to coil analysis																		see Table V - Basis of Estimate
1421-3125	Determine geometry&location of high COF shims&pl																		see Table V - Basis of Estimate
1421-3127	Structural analyses to performance rqmts for bol																		see Table V - Basis of Estimate
1421-3132	PDR to review requirements, design,&development																		see Table V - Basis of Estimate
	Conduct MC interface FDR																		see Table V - Basis of Estimate
AB/BC/AA welded joints																			
	Prepare winding form mods for weld clamping bolts																		see Table V - Basis of Estimate
INTRF-050	Complete Shim fabrication drawings (ORNL)																		see Table V - Basis of Estimate
	Release information for procurement of shim materia																		see Table V - Basis of Estimate
INTRF-055	FDR AB/BC/AA inboard shims																		see Table V - Basis of Estimate
CC bolted joint																			
I11-000	ESTABLISH CONCEPT																		see Table V - Basis of Estimate
I11-0000	PEER REVIEW OF JOINT CONCEPT																		see Table V - Basis of Estimate
	Add bolt holes to C winding form for CC interface																		see Table V - Basis of Estimate
	Bolt Reach and Access study (mockup)																		see Table V - Basis of Estimate
	Prepare CC shim drawings and release																		see Table V - Basis of Estimate
	FDR CC inboard shims																		see Table V - Basis of Estimate
Welded Joint Tests																			
Procedure																			
INTRF-035	PPPL Determine shim material																		see Table V - Basis of Estimate
INTRF-001	PPPL buy SS plate for weld trials																		see Table V - Basis of Estimate
INTRF-005	Weld distortion trials at PPPL on SS plate																		see Table V - Basis of Estimate
INTRF-025	ORNL build plywood mockup of flange																		see Table V - Basis of Estimate
INTRF-030	ORNL verify weld access, develop alternate welding method																		see Table V - Basis of Estimate
INTRF-010	Develop Weld Geometry Procedure																		see Table V - Basis of Estimate
Test																			
INTRF-015	Weld trials on two MCWF's at PPPL																		see Table V - Basis of Estimate
INTRF-020	Document results and update weld procedure																		see Table V - Basis of Estimate
Overall interface																			
INTRF-040	Analysis of tensil loads (ORNL)																		see Table V - Basis of Estimate
1421-3134	Develop specs & dwgs for station 2 &3 assy																		see Table V - Basis of Estimate
1421-3136	Conduct MC interface FDR incl job 141f																		see Table V - Basis of Estimate
1421-3138	Resolve issues, release assembly spec&drawings																		see Table V - Basis of Estimate
FY07 Rebaseline exercise																			
ECP53RBX05	FY07 Rebaseline Exercise																		see Table V - Basis of Estimate
Travel																			
	Trips for ORNL personnel to PPPL																		
	Trips for PPPL personnel to UT MDI																		
	TOTAL																		1020

NCSX June 2007 ETC
TABLE IV - Uncertainty of Estimate and Residual Risk Assessment

WBS Number: 142
WBS Title: Windings and Assembly
Job Number: 1421
Job Title: Design of Modular Coil Interfaces
Job Manager: David Williamson

Uncertainty of the Estimate

	<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Uncertainty Range (%)</u>	<u>Comments/Other Considerations</u>
Design Maturity			x	-10 to +50	Major issue is continuous iteration of design Major uncertainty is C-C access for bolting at machine assembly
Design Complexity		x			

Note: High/Medium/Low uncertainty assessment from Job Manager. Uncertainty range based on ACEI recommended practice 18R-97 as amended for NCSX.

Residual Impacts

<u>Risk</u>	<u>Likelihood of Occurring (%)</u>	<u>Mitigation Strategies</u>	<u>Consequence if Occurs</u>	
			<u>Cost</u>	<u>Schedule</u>
1 weld distortion found in R&D exceeds allowable assume double welding time	20%	add distortion control methods to welding procedure development, such as clamping bolts, peening, and alternate weld methods	\$70k+sched hit	6 wks
2 C-C access insufficient for bolts redesign and re-analyze alternate solution at CC	20%	Prepare mockups and check access directly	\$250k	

NCSX June 2007 ETC
TABLE V - Basis of Estimate

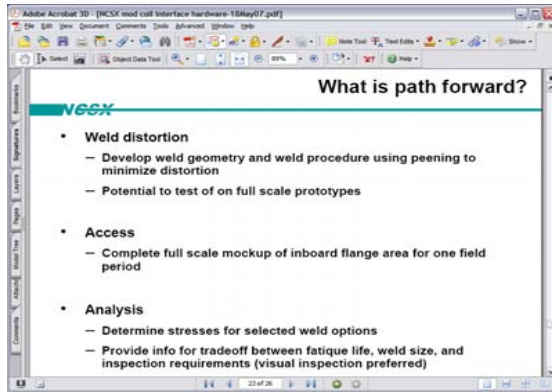
WBS Number: 142
WBS Title: Windings and Assembly
Job Number: 1421
Job Title: Design of Modular Coil Interfaces
Job Manager: David Williamson

Assumptions
Bladder design remaining and testing are in Larry Dudek's job 1431. Still need method to retain bladder and to provide bladder at B-A interface where bladder is much thicker

Engineering and Technician Hours

Color Key	ORNL	PPPL	multiplier	Pro-E models (avg)	Pro-E models (complex)	assy dwgs	Detail drawings	installation dwg	Cabling schematic	electrical schematic	I&C schematic	stress analysis	thermal analysis	special analysis (electromagnetics)	assembly specs and procedures	procurement/ lab and associated specifications	R&D reports	peer, preliminary and final design reviews	Planning	misc engr tasks	Comments for Engineering labor	crew size	shifts	time from detail	Comments for Technician labor
			unit	hrs/model	hrs/model	hrs/dwg	hrs/dwg	hrs/dwg	hrs/dwg	hrs/dwg	hrs/dwg	hrs/calc	hrs/calc	hrs/calc	hrs/proc	hrs/spec	hrs/report	hrs/rev	hrs/wk	hrs		hrs/shift			
	Total Engr hours	Total Tech hours																							
Outboard Interface Design																									
IH4-020	60	0					1																		
INTRF-045	40	0																1							
	60	0																							
Bolted Joint Tests																									
Tension Tests of Bolted Joint																									
1421-3067	8	48																				2	3		
1421-3075	8	16																				2	1		
1421-3077	24	24																				1	3		
1421-3079	24	24																				24			
1421-3084	24	24																				24			
1421-3087	24	24																				24			
1421-3081	160	160																				160			
1421-3090	40	0																1				1	3		
																						1	20		
Bolt Shear Test at 77k																									
1421-3112B	40	0																1							
1421-3115B	320	100																							
1421-3119B	80	0																				2.5	5		
Inboard Interface Design																									
IH1-001	520	0										2													
1421-3125	80	0			1																				
1421-3127	240	0										1													
1421-3132	40	0																							
AB/BC/AA welded joints																									
	300	0		3			3																		
INTRF-050	240	0																							
	24	0																							
INTRF-055	40	0																							
CC bolted joint																									
IH1-000	680	0		5	3		2																		
IH1-0000	80	0																							
	140	0			1		1																		
	200	0			2		2																		
	360	0				1	1	3																	
	40	0																							
Welded Joint Tests																									
Procedure																									
INTRF-035	40	0																							
INTRF-001	8	0																							
INTRF-005	40	0																							
INTRF-025	140	0			1		1																		
INTRF-030	40	0																							
INTRF-010	40	0													1										
Test																									
INTRF-015	80	600																							
INTRF-020	120	0																							
Overall interface design																									
INTRF-040	320	0			1							1													
1421-3134	300	0																							
1421-3136	40	0																							
1421-3138	240	0																							
FY07 Rebaseline exercise																									
ECP5R8X05	256	0																							
	5560	1020																							
	1390																								
TOTAL	6950																								

WBS Number: 142
WBS Title: Windings and Assembly
Job Number: 1421
Job Title: Design of Modular Coil Interfaces
Job Manager: David Williamson



NCSX June 2007 ETC
TABLE VI - Job 1421 Schedule Detail

WB	Sum of	BQ	sort code	ACT	TITLE	ES	EF	status comment	days	\$K			hours													
										41	actual may cost	ORNL35	ORNL41	EA/EM	EM/EM	EM/TB	EMT/TB	ORNLDA	ORNL	EM						
			1421						25%	106		\$12						150							1,210	
																										256
			142A	IH4-020	Re-baseline exercise	5/1/2007	6/15/2007			33																60
					Prepare outboard shim dwgs and release for comment	5/1/2007	6/15/2007	complete-A		33																40
					FDR prep outboard shims	6/18/2007	6/29/2007			10																0
					FDR outboard shims		6/29/2007			0																60
					Resolve chit's and issue shim drawings	7/2/2007	7/10/2007			6																
			142B	1421-3067	Procure 2 studs f/joint test.Use existing part	5/1/2007	7/25/2007			60	\$1							8								48
					Setup test fixture & perform JHA & pre-job brief	5/29/2007	5/30/2007			2								8								16
					Meas joint deflect vs preload & loss of preload	5/31/2007	6/4/2007			3								24								24
					Measure joint deflec & preload v. temp @80K	6/5/2007	6/7/2007			3								24								24
					Meas joint deflect & preload v. time (days) at R	6/18/2007	7/16/2007			20								160								160
					Measure joint deflection&preload v. cooldown cyc	6/8/2007	6/12/2007			3								24								24
					Perform pullout tests for tapped holes	6/13/2007	9/16/2007			3								24								24
					Document&conduct review of test results	7/17/2007	7/23/2007			5								40								
			142C	1421-3112B	Procure/fab parts for test&initial assembly	5/1/2007	7/25/2007			60	\$10							40								
					Assemble & test	7/26/2007	9/7/2007			31																320
					Document test results	9/10/2007	10/1/2007			16																80
			142D	1429-3026	COF cyclic testing	5/1/2007	5/18/2007	complete-A		14	\$30															
					Determine geometry&location of high COF shims&pl	5/1/2007	6/13/2007	complete-A		31																80
					Structural analyses to performance rqmts for bol	6/14/2007	6/20/2007	complete-A		5																240
					PDR prep for requirements, design,&development	6/14/2007	6/22/2007			5																40
					PDR to review requirements, design,&development		6/22/2007			0																
					Coil to coil scoping analysis	5/1/2007	6/15/2007			33		\$36														520
			142F	INTRF-049	prepare winding form mods for weld clamp bolts	6/13/2007	6/27/2007			11																300
					Complete Shim fabrication drawings (ORNL)	6/14/2007	7/2/2007			13																240
					Release info for procurement of shim material	5/1/2007	6/22/2007			38																24
					FDR prep AB/BC/AA inboard shims	8/2/2007	8/8/2007			5								40								
					FDR AB/BC/AA inboard shims		8/8/2007			0																
			142G	1421-3140	Prep C-C shim drawings and release	8/20/2007	9/7/2007			14																360
					FDR Prep for C-C shims	9/10/2007	11/6/2007			42																40
					Add bolt holes to C winding form for CC interfac	7/19/2007	8/2/2007	need before INTRF 015		11																140
					FDR C-C Shims		11/6/2007	was 11/30		0																
					Bolt reach & access study (mockup)	8/3/2007	8/10/2007			6																200
					ESTABLISH CONCEPT	6/1/2007	7/23/2007			36																680
					PEER REVIEW OF JOINT CONCEPT	7/24/2007	8/2/2007			8																80
			142H	INTRF-001	PPPL buy SS plate for weld trials	6/4/2007	6/15/2007			10	\$31							8								
					Weld distortion trials at PPPL on SS plate	6/18/2007	7/6/2007			14	\$0							40								20
					Develop Weld Geometry Procedure	7/3/2007	7/10/2007			5								40								
					ORNL build plywood mockup of flange	5/1/2007	6/20/2007			36		\$30														140
					ORNL verify weld access	6/21/2007	6/25/2007			3		\$20														40
					PPPL Determine shim material	5/1/2007	6/1/2007	complete-A		23								40								
			142I	INTRF-015	Weld trials on two MCWF's at PPPL	7/11/2007	7/30/2007			14	\$1							80								600
					Document results and update weld procedure	7/31/2007	8/7/2007			6								120								
			142J	1421-3134	Issue interface dwgs for comment	5/1/2007	7/20/2007			57																300
					FDR Prep	7/23/2007	8/8/2007			13																40
					Conduct BC, AB, AA, MC interface FDR incl JOB 1416					0																
					Resolve issues, release assembly spec&drawings	8/9/2007	8/15/2007			5																240
					ANalysis of tensile loads (ORNL)	5/1/2007	8/8/2007			70																320
																										4,840
																										6,050

Activity ID	MILE-stones (level 2 & 3)	Activity Description	Duration (work days)	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted							
										FY07	FY08	FY09	FY10	FY11	FY12	
Job: 1421 - Mod Coil Interface Design-WILLIAMSON																
Outboard Interface																
IH4-020		Prepare outboard shim dwgs and release	45	01MAY07	03JUL07		33		9,343.20	■	ORNLEM =60hr ;					
INTRF-045	3	FDR prep outboard shims	10	05JUL07	18JUL07		33		6,228.80	■	ornlem=40					
INTRF-046		FDR outboard shims	0		18JUL07		33		0.00	▼						
INTRF-047		Resolve chit's and issue outboard shim drawings	6	19JUL07	26JUL07		36		9,343.20	■	ornlem=60					
Outboard Interface-Bolted Joint Tests-Tension																
1421-3067		Procure 2 studs f/joint test.Use existing part	61*	01MAY07	26JUL07		0		6,089.76	■	EM//EM =08hr ; 41=01\$K ; EM//TB =48hr ;					
1421-3075		Setup test fixture &perform JHA & pre-job brief	2	27JUL07*	30JUL07		7		2,408.96	■	EM//EM =08hr ; EM//TB =16hr ;					
1421-3077		Meas joint deflect vs preload & loss of preload	3	31JUL07	02AUG07		7		5,423.28	■	EM//EM =24hr ; EM//TB =24hr ;					
1421-3079		Measure joint deflec & preload v. temp @80K	3	03AUG07	07AUG07		7		5,423.28	■	EM//EM =24hr ; EM//TB =24hr ;					
1421-3084		Measure joint deflection&preload v. cooldown cyc	3	08AUG07	10AUG07		7		5,423.28	■	EM//EM =24hr ; EM//TB =24hr ;					
1421-3087		Perform pullout tests for tapped holes	3	13AUG07	15AUG07		7		5,423.28	■	EM//EM =24hr ; EM//TB =24hr ;					
1421-3081		Meas joint deflect & preload v. time (days) at	20	16AUG07	13SEP07		7		36,155.20	■	EM//EM =160hr ; EM//TB =160hr ;					
1421-3090		Document&conduct review of test results	5	14SEP07	20SEP07		7		6,032.80	■	EM//EM =40hr ;					
Outboard Interface-Bolted Joint Tests-Shear																
1421-3112B		Procure/fab parts for test&initial assembly	60*	01MAY07	25JUL07		1		18,792.80	■	41=10\$K ; em//em=40					
1421-3115B		Assemble & test	31	27JUL07	10SEP07		0		57,345.40	■	ORNLEM =320hr ;EM//TB=100					
1421-3119B		Document test results	15	11SEP07	01OCT07		0		12,489.81	■	ORNLEM =80hr ;					
Inboard Interface-Design																
IH1-001		Coil to coil scoping analysis	62	01MAY07	27JUL07		21		116,974.40	■	ORNLEM =520hr ; ornlem=s=36					
1421-3125		Determine geometry&location of high COF shims&pl	40	01MAY07	26JUN07		3		12,457.60	■	ornlem =80hr ;					
1421-3127		Structural analyses to performance rqmts for bol	20	27JUN07	25JUL07		18		37,372.80	■	ORNLEM =240hr ;					
1421-3131		PDR prep for requirements, design,&development	5	26JUL07	01AUG07		18		6,228.80	■	ORNLEM =40hr ;					
1421-3132		PDR to review requirements, design,&development	0		01AUG07		18		0.00	▼						
Inboard Interface-AB/BC/AA																
INTRF-049		prepare winding form mods for weld clamp bolts	50	13JUN07*	22AUG07		3		46,716.00	■	ornlem=300					
INTRF-050		Complete Shim fabrication drawings (ORNL)	40	27JUN07*	22AUG07		3		37,372.80	■	ornlem=240					
INTRF-051		Release info for procurement of shim material	64*	01MAY07	31JUL07		18		3,737.28	■	ornlem=24					
INTRF-054	3	FDR prep AB/BC/AA inboard shims	5	28AUG07	04SEP07		0		6,032.80	■	em//em=40					
INTRF-055		FDR AB/BC/AA inboard shims	0		04SEP07		0		0.00	▼						
Inboard Interface-CC																
IH1-000		ESTABLISH CONCEPT	36	01JUN07*	23JUL07		64		105,889.60	■	ORNLEM =680hr ;					
IH1-0000		PEER REVIEW OF JOINT CONCEPT	8	24JUL07	02AUG07		64		12,457.60	■	ORNLEM =80hr ;					

Activity ID	MILE-stones (level 2 & 3)	Activity Description	Duration (work days)	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted	FY07						
										FY07	FY08	FY09	FY10	FY11	FY12	
1421-3143		Add bolt holes to C winding form dwg CC interfac	11	03AUG07*	17AUG07		64		21,800.80	ORNLEM =140hr ;						
1421-3143X		Release dwg for add'l holes in C coil	0		17AUG07		64		0.00	▼						
1421-3145		Bolt reach & access study (mockup)	6	01OCT07*	08OCT07		449		32,352.00	ORNLEM =200hr ;						
1421-3140		Prep C-C shim drawings and release	14	09OCT07	26OCT07		449		58,233.60	ORNLEM =360hr ;						
1421-3142		FDR Prep for C-C shims	42	29OCT07	07JAN08		449		6,470.40	■ ORNLEM =40hr ;						
1421-3144	3	FDR C-C Shims	0		07JAN08		449		0.00	▼						
Weld Access test																
INTRF-025		ORNL build plywood mockup of flange	20	14MAY07*	11JUN07		1,314		51,800.80	■ orn41=30; ornlem=140						
INTRF-030		ORNL verify weld access	7	12JUN07	20JUN07		1,314		45,228.80	ornlem=40 orn41=39						
INTRF-010		Develop Weld Geometry Procedure	5	21JUN07	27JUN07		1,314		6,969.20	ea//em=40						
Overall MC Interface																
INTRF-040		ANALYSIS of tensile loads (ORNL)	75	01MAY07	15AUG07		13		49,830.40	■ ornlem=320						
1421-3134		Issue interface dwgs for comment	75	01MAY07	15AUG07		0		46,716.00	■ ORNLEM =300hr ;						
1421-3135		FDR Prep	13	16AUG07	04SEP07		0		6,228.80	■ ORNLEM =40hr ;						
1421-3136	2	Conduct BC,AB,AA,Interface FDR incl job 1416	0		04SEP07		0		0.00	▼						
1421-3138		Resolve issues, release assembly spec&drawings	5	05SEP07	11SEP07		0		37,372.80	ORNLEM =240hr ;						
INTRF-100																
INTRF-100		Misc travel, meetings,reporting,job 1416&1421	207	01MAY07	29FEB08		1,148	LOE	233,092.79	■ 35=3k; orn135=9k ornlem=1240;em//em=150						
REBASE1421		Re-baseline exercise	33*	01MAY07*	15JUN07		1,322	LOE	39,864.32	■ ornlem=256						
Subtotal			207	01MAY07	29FEB08		1,148		1,207,123.44	▼						