NCSX Work Approval Form (WAF) WBS Number: 185 WBS Title: Assembly of Field Periods Job Numbers: 1802, 1810, and 1815 Job Title: FPA Oversight & support (1802) Job Title: FPA Operations - Stations 1, 2, & 3 (1810) Job Title: FPA Operations - Station 5 (1815) Job Manager: Mike Viola Description: This WBS element consists of those activities associated with the assembly of the three individual field periods in the TFTR Test Cell. Schedule: See Attached Approvals: Job Manager Date Responsible Line Manager Date Project Manager Date **Engineering Department Head** Date

NCSX June 2007 ETC TABLE I - DESIGN LABOR

IMPO N. I. 405		-	1	1	1	1					
WBS Number: 185											
WBS Title: Assembly of Field Periods											
Job Numbers: 1802, 1810, and 1815											
Job Title: FPA Oversight & support (1802)											
Job Title: FPA Operations - Stations 1, 2, & 3 (1810)											
Job Title: FPA Operations - Station 5 (1815)											
Job Manager: Mike Viola											
Description:				1			1	1			
Description.			-	 	-			ļ			
TASK DESCRIPTION Work da	/s 41MS	48MS	35TRV 37STK L		ORNLE M	ORNLDSN	EMEM	EMSM	EMSB	CREW	
Design											
This is a Fabrication Job - All labor in Table III											

NCSX June 2007 ETC TABLE II - Materials and Subcontracts

WBS	Number: 185						
	Title: Assembly of Field Periods						
	Numbers: 1802, 1810, and 1815						
Job '	Title: FPA Oversight & Support (1802)						
Job.	Title: FPA Operations - Stations 1, 2, &	3 (1810)					
	Fitle: FPA Operations - Station 5 (1815)						
		,					
Job	Manager: Mike Viola						
Mate	rials and Supplies						
Metrolo	gy Consumables - Input by Steve Raftopoulos						Basis of Estimate
СС	Item	Quantity	Cost	Annual cost	Years	FY'07-FY'09 Cost Comment	
		-, ,					
5323	Generic replacement or consumables			0.45		045,000,0	
-	Surface probe kits Replacement Leica Workstation Computer	2	\$7,500 \$3,000	\$15,000 \$3,000	1	\$15,000 Consumable \$3,000	Recent procurements Recent procurements
	Replacement Leica Workstation Computer Replacement Laptops for Romer Arms	3	\$3,000	\$3,000	1	\$9,000	Recent procurements Recent procurements
	Replace Thommen Sensor for Leica Tracker	1	\$1,500	\$1,500	2	\$3,000	Recent procurements
	Replacement tips for Leica and FARO surface probes	4	\$300	\$1,200	3	\$3,600 Consumable	Recent procurements
	1.5" CCRs 2 per year, per tracker	4	\$2,000	\$8,000	3	\$24,000 Consumable	Recent procurements
	0.5" CCRs 2 per year, per tracker	4	\$1,200	\$4,800	3	\$14,400 Consumable	Recent procurements
	Replacement misc. computer parts	1	\$700	\$700	3	\$2,100 Consumable	Recent procurements
	Replacement/additional extension bar kits	2	\$1,000	\$2,000	3	\$6,000 Consumable	Recent procurements
	Replacement and special nests and adapters Replacement/additional 1.5" CCR drift nest pucks	15 30	\$300 \$30	\$4,500 \$900	3	\$13,500 Consumable \$2,700 Consumable	Recent procurements Recent procurements
	Replacement Probe Tips for Romer Arms	6	\$600	\$3,600	3	\$10,800 Consumable	Recent procurements Recent procurements
	Replacement Flobe Tips for Romer Arms	Ů	ΨΟΟΟ	ψ3,000	<u> </u>	\$10,000 Consumable	Necent productions
			Subtotal	\$54,200		\$107,100	
5323	Generic one-time needs		00.000	* 4.000		Od one Ore time word	
	2 - Prortable Brunson Stands Dial indicators for Coil Winding Turning fixture	6	\$2,000 \$200	\$4,000 \$1,200	1 1	\$4,000 One-time need \$1,200 One-time need	Recent procurements Recent procurements
	Brunson Adapter plates	6	\$500	\$3,000	1	\$3,000 for mounting of equipment in various configurations	Recent procurements
	Recondition/maintenance of K&E stands	4	\$500	\$2,000	1	\$2,000 stands are old and need maintenance	Recent procurements
			Subtotal	\$10,200		\$10,200	
Job 181							
9450	NCSX specific needs Monuments/nests for floor grid in NCSX test cell	75	\$75	\$5,625	2	\$11.250 NCSV specific and time peed	Pocent producements
	Reflector holders for wall - NCSX test cell	75 50	\$150	\$5,625	1	\$11,250 NCSX specific one-time need \$7,500 NCSX specific one-time need	Recent procurements Recent procurements
	Leica fixed position reflectors for NCSX test cell walls	50	\$300	\$15,000	1	\$15,000 NCSX specific one-time need	Recent procurements
	Leica 0.5" CCRs	15	\$1,200	\$18,000	1	\$18,000 reflectors required to track FPA assembly in mid-air fli	
						positioning	
			0	640.405		654.750	
			Subtotal	\$46,125		\$51,750	
5323	Annual software and hardware maintenance costs						
3020	Annual Service Contract for Leica Tracker	1	\$17,500	\$17,500	3	\$52,500 Consumable	Recent procurements
	Annual Software maintenance Verisurf	2	\$1,750	\$3,500	3	\$10,500 Annual software renewal to stay current	Recent procurements
	Annual Software maintenance Romer	3	\$1,750	\$5,250	3	\$15,750 Annual software renewal to stay current	Recent procurements
	Romer Arm Maintenance agreements	3	\$4,500	\$13,500	3	\$40,500 We've been spending \$5k/arm (\$15K tot) each year for	
						repairs. Maint. agreement provides for loaner and/or of	uicker
-						turnaround.	
		1	Subtotal	\$39,750		\$440.250	
-			Suptotal	\$39,750		\$119,250	
	Total			\$150,275		\$288,300	
				, , , , , , , ,			
	Total Cost to NCSX			\$46,125		\$51,750	

WBS Number: 185															
WBS Title: Assembly of Field Periods															
Job Numbers: 1802, 1810, and 1815															
Job Title: FPA Oversight & Support (1802)															
Job Title: FPA Operations - Stations 1, 2, & 3 (1810)															
Job Title: FPA Operations - Station 5 (1815)															
Job Manager: Mike Viola															
oob manager. mike viola															
Fabrication and Assembly								1 1		l					
Assumptions:															
A				- 1				1							
Assumes 5 day workweek 1 shift no overtime				- 1	- 1	1	1	1 1							
Parallel ops for sta 5 (2 fixtures available)															
Parallel ops for sta 5 (2 fixtures available)		<u> </u>										L	_		
Only 1 fixture for station 3 only															-
Parallel ops for sta 2															
			K	\$					FTE						
				.	M.	2	<u> </u>	_					ew		
		Work	1MS	118	STR	RNL	ál m	E	4SM	(SB	ATB	REW	Ö		
TASK DESCRIPTION		days	41	378	35	S S	E E	N. W.	E	EM	\equiv	8	Me	Basis of Estimate	
														Estimate based on recent NCSX FPA	
														activities and the amount of oversight	
														and supervision that is required,	
Job 1802															
Oversight & Supervision							·								checked with primavera
														this is LOE adjust consistent with overall	
Metrology Engineering Supervision Station 1 through station 5 raftopolous 50%								0.50						schedule	checked with primavera
														this is LOE adjust consistent with overall	
PPPL EM LOE Station 1 through station 5 Viola 100%								1.00						schedule	checked with primavera
														this is LOE adjust consistent with overall schedule. See table V for detail from	
Title III field period assembly Station 1 through station 5 ORNL support														Mike Cole	checked with primavera
Thie in held period assembly Station 1 through station 3 Orthe support	_	1	1 1	- 1		1	1	1				1		this is LOE adjust consistent with overall	checked with philiavera
HP Coverage in the TFTR TC LOE Station 1 through station 3 @.75 fte							0.75	5						schedule	checked with primavera
Station 2-Modular Coil Sub- Assembly				,	- 1	1	0	-							checked with primavera
Sequence Plan (Brown) - Covered in Job 1803			1 1	- 1											checked with primavera
Systems Analysis (Brooks) - covered in Job 8204															checked with primavera
Metrology Plan (Elllis) - Covered in Job 8205															checked with primavera
Procedures written & approved		14.0													checked with primavera
JHA completed		6.0													checked with primavera
Training needs identified & released		6.0													checked with primavera
ACC review completed		2.0													checked with primavera
Pre-job brief completed	_	1.0													checked with primavera
Station 2 operational						1		1							checked with primavera
Station 3-Modular Coil to VVSA Assembly			1	-				1							checked with primavera
Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204	-	1					1	+				\vdash			checked with primavera
Metrology Plan (Elllis) - Covered in Job 8205		1		-		-		1							checked with primavera checked with primavera
	+			-+	-+			+							
Procedures approved		10.0													checked with primavera
JHA completed	-	6.0		_		-		+							checked with primavera
Training needs identified & released	-	6.0				-									checked with primavera checked with primavera
ACC review completed Pre-job brief completed	+	6.0		-		-		1							checked with primavera
Station 3 operational	+	1.0		-		-	1	+							checked with primavera
Fixtures installed		6.0		-+		1		+							checked with primavera
		0.0								1		1			checked with billiavera

WBS Number: 185														
VBS Title: Assembly of Field Periods														
ob Numbers: 1802, 1810, and 1815														
ob Title: FPA Oversight & Support (1802)														
ob Title: FPA Operations - Stations 1, 2, & 3 (1810)														
ob Title: FPA Operations - Station 5 (1815)														
ob Manager: Mike Viola														
abrication and Assembly		-						1			l			
ssumptions:														
·								1						
Assumes 5 day workweek 1 shift no overtime														
Parallel ops for sta 5 (2 fixtures available)														
Parallel ops for sta 5 (2 fixtures available)														
Only 1 fixture for station 3 only														
Parallel ops for sta 2														
tation 5-Final Field Period Assembly												•		checked with primavera
Sequence Plan (Brown) - Covered in Job 1803														checked with primavera
Systems Analysis (Brooks) - covered in Job 8204														checked with primavera
Metrology Plan (Elllis) - Covered in Job 8205														checked with primavera
Procedures approved		14.0												checked with primavera
JHA completed		6.0												checked with primavera
Training needs identified & released		6.0												checked with primavera
ACC review completed		7.0												checked with primavera
Pre-job brief completed		7.0												checked with primavera
Station 5 operational		1.0												checked with primavera
ob: 1802 - FP Assy Oversight&Support-VIOLA Total	•		\$ - #	## ##	#	0	1	2	0	0	()	•	checked with primavera
														checked with primavera

WBS Number: 185													I	
WBS Title: Assembly of Field Periods														
Job Numbers: 1802, 1810, and 1815														
Job Title: FPA Oversight & Support (1802)														
Job Title: FPA Operations - Stations 1, 2, & 3 (1810)														
Job Title: FPA Operations - Station 5 (1815)														
Job Manager: Mike Viola														
Fabrication and Assembly Assumptions:				1			1 1	1						
·														
Assumes 5 day workweek 1 shift no overtime														
Parallel ops for sta 5 (2 fixtures available)														
Parallel ops for sta 5 (2 fixtures available)											ΙŢ			
Only 1 fixture for station 3 only														
Parallel ops for sta 2														
		 '	(\$	1 1		1	F	TE				_		checked with primavera
			7 Z		RNL M/DSN		7	4	_	~	>	rew		
	Work	W.	SI	OT	Z Q	H	MEM	MSM	MSB	MTB	3EW	ot O		
TASK DESCRIPTION	days	4	35	31	Ö	S	Ξ	ñ	ā	ñ	Ö	Ž	Basis of Estimate	
ob: 1810 - Field Period Assembly-VIOLA														
													Station 1: Based on actual VV #1	ale a disease of the section as a second
													costs - almost completed. Station 2: Based on actual VV #1	checked with primavera
													costs - almost completed.	checked with primavera
													and a minor completion.	oncokea with primavera
													Based on experience to accomplish	
													similar tasks (e.g., metrology scans/lock-	
													ins, coil trial fitups, gross checks). Also,	
													it appears that your single shift activity is running parallel resources that are not	
													available. i.e. the trials development	
													crew are the same as the FP crew.	checked with primavera
													Nose/Bushing related items based on	
													conceptual designs and rough estimates	checked with primavers
													Assumed nose concept based on	onoonod mar primavore
													application of epoxy & set-up times	checked with primavera
													estimates based on conceptual	
													designs tempered with experieince in	
													alignment of multiple components	checked with primavera
eneral F.P. Assy support														checked with primavera
													2 men 3 day a week .LOE adjust	
LOE Crane support, fixture setupfor . Station 1 through station 5 1.2 fte										1.20			consistent with schedule thru Station 5	checked with primayor
ESE State Support, include Setupior . Station 1 tillough station 5 1.2 fte		1		1						1.20			This is LOE adjust consistent with	oncoxed with phillavera
LOE Field Supervision for station 1 through station 5 edwards 1.0fte								1.00					overall schedule thru Station 5.	checked with primavera
.,													this is LOE adjust consistent with overall	
													schedule. Hours distributed per task	
LOE Metrology support Station 1 tthrough station 5 1.5 fte engr plus ducco 100%							1.50			1.00			based resource profile	checked with primavera
Nr. 1100 - 11 - 11 - 1 - 1 - 1		01//					1 T				ΙŢ		01//th	
Misc M&S station 1 through station 5		3K/month	/e										3K/month	checked with primavera
		,	(\$				Ho	ours						checked with primavera

VBS Number: 185														
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lob Title: FPA Operations - Station 5 (1815)														
lob Manager: Mike Viola														
abrication and Assembly														
ssumptions:														
Assumes 5 day workweek 1 shift no overtime														
Parallel ops for sta 5 (2 fixtures available)														
Parallel ops for sta 5 (2 fixtures available)						1								
Only 1 fixture for station 3 only	1											-		-
Parallel ops for sta 2	+						1 1							
	1			4	-		1 1					3		
	XX7l	2	×	ے الا	RNL MDSN	ω	×	M	В	д	≥	ž.		
TASK DESCRIPTION	Work days	<u> </u>	STK	<u> </u>	A M	HTB	MEM	MSM	MSB	MTB	REW	ĕ	Basis of Estimate	checked with primaver
	uays	4	6	9 8	ОШ	S	Щ	Щ	ш	Щ	O	2	Dasis of Estimate	
ation 1-FP #1 VV Prep (hard surface components)										-	- 1			checked with primaver
Layout diagnostic&coolant paths on vessel - Completed	35.0													checked with primaver
Install heater tape on vertical ports - Completed Verify installation of heater tapes - Completed	7.0													checked with primaver checked with primaver
Attach studs for coolant lines - Completed	3.0													checked with primave
Wind magnetic diagnostic sensors - Completed	14.0			_										checked with primave
Install precision magnetic diagnostic sensors - Completed	 3.0		-											checked with primave
Verify installation magnetic diagnostic sensors - Completed	 4.0													checked with primave
Install local I&C (incl thermocouples) - Completed	5.0													checked with primave
Verify installation of local I&C	2.0													checked with primave
Install cooling/htg lines to vac vsl	15.0)								300	2.5			checked with primave
													serial tasks alternating between FPA	
Weld cooling/htg risers	16.0	\$ 2.0K								320	2.5		constant 2.5 men	checked with primaver
													serial tasks alternating between FPA	
Verify InstI of H/C lines,headers,manifolds	5.0)								100	2.5		constant 2.5 men	checked with primaver
										400			serial tasks alternating between FPA	and the second
Perform final acceptance testing (H/C flow test)	5.0	\$ 4.0K								100	2.5		constant 2.5 men serial tasks alternating between FPA	checked with primaver
Trim coal plates	2.0									40	2.5		constant 2.5 men	checked with primaver
Trim seal plates	2.0		_	_						40	2.3		serial tasks alternating between FPA	checked with primaver
Loop termination & verification	18.0	,								360	2.5		constant 2.5 men	checked with primaver
install Final Internal and External monuments and measure	4.0					-	+			80	2.5		outleast 2.0 mon	checked with primaver
	7.0	1								30	2.0		serial tasks alternating between FPA	zz.nod mar pinnavoi
Final Scan	4.0									80	2.5		constant 2.5 men	checked with primaver
													serial tasks alternating between FPA	
Install heater tape on removeable ports	10.0									200	2.5		constant 2.5 men	checked with primaver
													serial tasks alternating between FPA	
Prepare and transfer completed VV to holding are	2.0	d l	- 1		l	1	1 1			40	2.5		constant 2.5 men	checked with primaver

WBS Number: 185												
WBS Title: Assembly of Field Periods												
Job Numbers: 1802, 1810, and 1815												
Job Title: FPA Oversight & Support (1802)												
Leb Title: FDA Overstiene Ctetiene 4 0 8 2 (4040)						-						
Job Title: FPA Operations - Stations 1, 2, & 3 (1810)												
Job Title: FPA Operations - Station 5 (1815)												
Job Manager: Mike Viola												
Fabrication and Assembly Assumptions:					T	1	т т	ı ı				
•												
Assumes 5 day workweek 1 shift no overtime												
Parallel ops for sta 5 (2 fixtures available)												
Parallel ops for sta 5 (2 fixtures available)												
Only 1 fixture for station 3 only												
Parallel ops for sta 2												
Station 1- FP #2 VV Prep (hrd surf cmpnts)												checked with primavera
Misc Hardware - Completed Layout diagnostic&coolant paths on vessel - Completed		107	\$ 2.0K									checked with primavera
Install heater tape on vertical ports - Completed		12.0										checked with primavera
Verify installation of heater tapes - Completed		1.0										checked with primavera
Attach studs forcoolant lines - Completed		3.0	5			1						checked with primavera
Wind magnetic diagnostic sensors - Completed		14.0)									checked with primavera
Install precision magnetic diagnostic sensors - Completed		3.0	D .									checked with primavera
Verify installation magnetic diagnostic sensors - Completed		4.0										checked with primavera
Install local I&C (incl thermocouples) - Completed		5.0)									checked with primavera
Verify installation of local I&C - Completed		2.0	D									checked with primavera
											Serial tasks alternating between FPA	
Install cooling/htg lines to vac vsl		15.0	o						300	2.5	constant 2.5 men.	checked with primavera
											Serial tasks alternating between FPA	
											constant 2.5 men. Delayed due to coil	
Weld cooling/htg risers		16.0	\$ 2.0K						320	2.5	tests	checked with primavera
Verify InstI of H/C lines,headers,manifolds		5.0							100	2.5	Serial tasks alternating between FPA	
,											constant 2.5 men. Serial tasks are	
											showing up as parallel on schedule	checked with primavera
											Serial tasks alternating between FPA	
Perform final acceptance testing (H/C flow test)		5.0	\$ 4.0K						100	2.5	constant 2.5 men	checked with primavera
Trim seal plates		2.0	5						40	2.5	Serial tasks alternating between FPA	
, , , , , , , , , , , , , , , , , , ,											constant 2.5 men. Need to buy high	
											strength nibbler.	checked with primavera
		 	1	+	+	-	+ + +				Serial tasks alternating between FPA	oncoked with primavera
Loop termination & verification		18.0							360	2.5	constant 2.5 men	checked with primavera
install Final Internal and External monuments and measure		4.0		+-	+	 	+		80	2.5	CONSIGNIC Z.O MICH	checked with primavera
		4.0	1		1	 	1 1		00	2.0	Serial tasks alternating between FPA	onconou with primavera
Final Scan		4.0							80	2.5	constant 2.5 men	checked with primavera
i mai Souli		4.0	1	+	1	 	1 +		30	2.0	Serial tasks alternating between FPA	Shooked with primavera
Install heater tape on removeable ports		10.0							200	2.5	constant 2.5 men	checked with primavera
		.0.0		 +	+		+ +		200	2.0	Serial tasks alternating between FPA	Shooked with primavera
Prepare and transfer completed VV to holding are		2.0							40	2.5	constant 2.5 men	checked with primavera
ropare and transfer completed vivio nothing are		2.0	4	 +	+		+ +		40	۷.٥	CONSTANT 2.3 MON	checked with primavera
L L	1		1			1		-				checked with primavera

WBS Number: 185											
WBS Title: Assembly of Field Periods			1								
Job Numbers: 1802, 1810, and 1815			1								
Job Title: FPA Oversight & Support (1802)											
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Job Title: FPA Operations - Stations 1, 2, & 3 (1816)			+								
Job Manager: Mike Viola											
			-								
Fabrication and Assembly			1								
Assumptions:											
Assumes 5 day workweek 1 shift no overtime											
Parallel ops for sta 5 (2 fixtures available)											
Parallel ops for sta 5 (2 fixtures available)			Ċ		•						
Only 1 fixture for station 3 only											
Parallel ops for sta 2											
Station 1- FP #3 VV Prep (hrd surf cmpnts) Misc Hardware		\$ 2.0K	1	1			1				checked with primavera checked with primavera
Layout diagnostic&coolant paths on vessel - Completed	12.0	Ψ 2.01	+					240 2	5	15% complete	checked with primavera
										Serial tasks alternating between FPA	
									_	constant 2.5 men. Not started yet due to	
Install heater tape on vertical ports	7.0		+					140 2	5	coil alignment tests Serial tasks alternating between FPA	checked with primavera
										constant 2.5 men. Not started yet due to	
Verify installation of heater tapes	1.0							20 2	5	coil alignment tests	checked with primavera
										Serial tasks alternating between FPA	
Attach studs for coolant lines	3.0							60 2	5	constant 2.5 men. Not started yet due to coil alignment tests	checked with primavera
This is the second in the seco	0.0							00 2		Serial tasks alternating between FPA	onconoa mar primarora
.									_	constant 2.5 men. Not started yet due to	
Install Templates	3.0		-					60 2.	5	coil alignment tests Serial tasks alternating between FPA	
										constant 2.5 men. Not started yet due to	
Wind magnetic diagnostic sensors	14.0							280 2	5	coil alignment tests	checked with primavera
										Serial tasks alternating between FPA	
Install precision magnetic diagnostic sensors - Completed	3.0							60 2	5	constant 2.5 men. Serial tasks alternating between FPA	checked with primavera
Verify installation magnetic diagnostic sensors - Completed	4.0							80 2	5	constant 2.5 men.	checked with primavera
, , , , , , , , , , , , , , , , , , , ,										Serial tasks alternating between FPA	onconoa mar piimarora
Install local I&C (incl thermocouples)	5.0							100 2	5	constant 2.5 men.	checked with primavera
Verify installation of local I&C	2.0							40 2	5	Serial tasks alternating between FPA constant 2.5 men.	checked with primavera
Verify installation of local fac	2.0							40 2	3	Serial tasks alternating between FPA	checked with philiavera
Install cooling/htg lines to vac vsl	15.0							300 2		constant 2.5 men.	checked with primavera
Weld cooling/htg risers	16.0							320 2	5	Serial tasks alternating between FPA	
										constant 2.5 men Experience is 8 tubes per day 128 tubes per VVSA	checked with primavera
										Serial tasks alternating between FPA	
Verify Instl of H/C lines,headers,manifolds	5.0							100 2	5	constant 2.5 men.	checked with primavera
Perform final acceptance testing (H/C flow test)	5.0							100 2	5	Serial tasks alternating between FPA constant 2.5 men	chacked with primayers
Perform final acceptance testing (n/c now test)	5.0							100 2	.5	Serial tasks alternating between FPA	checked with primavera
Trim seal plates	2.0							40 2	5	constant 2.5 men	checked with primavera
Loop termination & verification	18.0							360 2	5		checked with primavera
Install Final Internal and External monuments and measure	4.0							80 2	E	Serial tasks alternating between FPA constant 2.5 men.	checked with primavera
mistan rinai mtemai and external monuments and measure	4.0		+					0U Z	J	Serial tasks alternating between FPA	checked with primavera
Final Scan	4.0		\perp	<u></u>				80 2	5	constant 2.5 men.	checked with primavera
										Serial tasks alternating between FPA	
Install heater tape and insulation on removeable ports	 10.0		 1-					200 2	5	constant 2.5 men	checked with primavera
Prepare and transfer completed VV to holding area	2.0							40 2	5	Serial tasks alternating between FPA constant 2.5 men.	checked with primavera
Station 1-Spool pieces (3) (spacers)	2.0		-		1	1 1	 1	2702	J ₁	constant 2.5 men.	checked with primavera
Attach diagnostics, studs and coolant lines	17.0							340 2	5		checked with primavera
install Final Internal and External monuments and measure	2.0							40 2	5		checked with primavera

14/50 ::	1 405											T	T
	mber: 185												
WBS Titl	e: Assembly of Field Periods												
Job Num	bers: 1802, 1810, and 1815												
Job Title	: FPA Oversight & Support (1802)												
	: FPA Operations - Stations 1, 2, & 3 (1810)												
	: FPA Operations - Station 5 (1815)												
Job Man	ager: Mike Viola												
F-1ii													
Assumption	and Assembly												
Assumption													
	Assumes 5 day workweek 1 shift no overtime												
	Parallel ops for sta 5 (2 fixtures available)												
	Parallel ops for sta 5 (2 fixtures available)												
	Only 1 fixture for station 3 only												
	Parallel ops for sta 2												
													checked with primavera
Station 2 Tr				_									checked with primavera
	Trial tensioning test on prototype		2.0	\$ 3.0K					40	2.5			checked with primavera
	Trial bushing and shim test on prototype	<u> </u>		\$ 2.0K	+				240	2.5			checked with primavera
	Bushing test B-C Alignment mechanisms, metro equipt &positioning		7.0) ¢ 40 0V	+ + + -		 		112 120	2.0			checked with primavera
	Procure alignment mechanisms, fiducials, lifting	 	20.0	\$ 40.0K \$ 25.0K					400	2.5			checked with primavera
			20.0						+00	2.0		Perform welding trials and procure	oncoked with primavera
<u></u>	Consulting support for NOSE WELDING		loe	\$ 70.0K								EWI and Bob Parcells support.	checked with primavera
	Determine fiducial types&locations		11.0	\$ 2.0K					220	2.5			checked with primavera
	Procure monuments&related metrology equipment		15.0	\$ 15.0K					300	2.5			checked with primavera
INTRF-001	PPPL buy SS plate for weld trials		10						31				
INTRF-035	PPPL Determine shim material		23				40		0.4				
PHIL-04	water jet cut shims for A/B flange weld test solution anneal shims (note: shims not ground).		3					8	24				
PHIL-05 PHIL-06	assemble shims&flangesgrind relief in flanges		3					0	48				
PHIL-07	weld & monitor distortion; improvise clamping		3						48				
PHIL-11	Mount A6 on angle plate		1						16				
PHIL-12	Weld fiducials on A6 & B6		2						32				
PHIL-13	Measure A6 casting		2						0				
PHIL-15	Remove A6 & lower & grout wedge		4						64				
PHIL-16	Re-mount A6 on wedge		2						32				
PHIL-17	Re-measure A6		2						0				
PHIL-18	Measure B6 on wedge		2						32				
PHIL-19	Place B6 on A6; Meas B6 casting use A6 as base		2						0				
PHIL-21	Prepare angle plate dogs & chocks Water jet cut outboard 0,5" stk 316 SS shims		4						64 32				
PHIL-22 PHIL-23	Water jet cut inboard 0,625 316 SS		3						24				
PHIL-24	Assemble castings, align torque&meas inbd. shims		4						64				
PHIL-27	Solution anneal shims		2					16	Ŭ.				
PHIL-32	Align castings		2						32				
PHIL-33	Fit&install bushings 25% stock, 25% eccentric		5						80				
PHIL-34	Weld procedure/weld qual.		7						56				
PHIL-36	Install strain gauges		5		+			40					
PHIL-37	Set up dial ind., CMM, transit system		5		+				40				
PHIL-38	Install all shims and adjust bushings Final align and baseline measurements		3		+++-		 		32 72				
PHIL-39 PHIL-40	Perform 25% of welding & measure		2		+ + + -				32	+			
PHIL-40 PHIL-41	Perform 50% of welding & measure Perform 50% of welding & measure		2		+ + + -				32				
PHIL-41	Perform 75% of welding & measure		2						32				
PHIL-43	finish welding & measure		2						32				
PHIL-25	Purchase (2) grinding machines		45										
PHIL-26	Grind inbd. Shims to thickness (outside shop)		4										
PHIL-30	Zenex - fabricate eccentric bushings		5										
	Hardware rework (1/2 FTE)		120.0	\$ 10.0K					960	1.0		MISC LOE SUPPORT	checked with primavera
Station 2 Se													checked with primavera
	Misc Hardware			\$ 5.0K									checked with primavera
			7.0	11	1 1 1	1	1		140	2.5			checked with primavera
	Test out equipt & procedures												also also also distributo di contra di contra
3.00	Test out equipt & procedures Receive drawings and hardware (shims and bolts) Shim sizing / preparations		7.0						140	2.5			checked with primavera checked with primavera

WBS Nu	mber: 185										
NBS Tit	le: Assembly of Field Periods										
	nbers: 1802, 1810, and 1815										
	e: FPA Oversight & Support (1802)										
	E: FPA Operations - Stations 1, 2, & 3 (1810)										
	e: FPA Operations - Station 5 (1815)										
JOD Wan	ager: Mike Viola										
abrication	and Assembly										
ssumption											
	Assumes 5 day workweek 1 shift no overtime				- '	 T T	1				
	Parallel ops for sta 5 (2 fixtures available)									+	
										_	
	Parallel ops for sta 5 (2 fixtures available)			_							
	Only 1 fixture for station 3 only										
3.02	Parallel ops for sta 2 Surface grind a set of metal shims that will be used on the first MCHP article for assembly process										
3.02	qualifications.									Actual experience (LED: actual	
		12.0						240	2.5	Experience Was 4 days per JOINT)	checked with primavera
3.03	Compress alumina coated shims and sort by thickness the shim set that will be installed on the MCHP.	12.0						240	2.5		
		6.0						120	2.5	800 shims - not critical path	checked with primavera
4.00	Pre-Installation Station 2 set-up										
	L. HARDER C. L.									Metrology plan covering Station 2:	checked with primavera
4.01	Install MCHP fixtures and metrology equipment.									not critical path - separate crew in parallel	all and and artificial and accommodity
4.02	Perform metrology set-up and checks			_						not critical path - separate crew in	checked with primavera
4.02	r chom metrology see up and checks	5.0						100	2.5	parallel	checked with primavera
	Install FIRST Holding 20 deg fixture		\$ 2.01	ĸ				80	2.5	paraner	checked with primavera
	Install SECOND Holding 20 deg fixture		\$ 2.01					60	2.5	Just received - Not done yet	checked with primavera
	Install THIRD Holding 20 deg fixture	6.0						120	2.5	Just received - Not done yet	checked with primavera
	Install LAST Holding 20 deg fixture		\$ 2.01					60	2.5	Just received - Not done yet	checked with primavera
	Tools&tooling available for FPA operations	2.0		1 1				40	2.5	·	checked with primavera
	-						İ	_			checked with primavera

Job Numbers: 1802, 1810, i Job Title: FPA Oversight & Job Title: FPA Operations of the control o	per: 185											
ob Title: FPA Oversight & ob Title: FPA Operations ob Title: FPA Operations ob Title: FPA Operations ob Manager: Mike Viola abrication and Assembly ssumptions: Assumes 5 day workv Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 TATION 2 Te-measauring and fitup checks 1.00 MC fit-up pre-check and station of the valis of the pre-check and station of the pre-check an	Assembly of Field Periods											
ob Title: FPA Operations ob Title: FPA Operations ob Title: FPA Operations ob Manager: Mike Viola abrication and Assembly ssumptions: Assumes 5 day workv Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 TATION 2 Te-measauring and fitup checks 1.00 MC fit-up pre-check and state of the sta	ers: 1802, 1810, and 1815											
bb Title: FPA Operations ob Title: FPA Operations ob Title: FPA Operations ob Manager: Mike Viola bbrication and Assembly ssumptions: Assumes 5 day workv Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 e-measauring and fitup checks 1.00 Mc fit-up pre-check and station of the pre-	PA Oversight & Support (1802)											
britale: FPA Operations ob Manager: Mike Viola brication and Assembly sumptions: Assumes 5 day workv Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 (Only 1 fixture for stati Parallel ops for sta 2 (TATION 2 e-measauring and fitup checks 1.00 MC fit-up pre-check and si 1.01 Verify that mating MC's of a This will include the Type-C 1.02 Epoxy paint all close fitting in 2.00 Pre-measurement of MCH 2.01 Set the Type-A coil on the parallel ops for static parallel ops for sta 2 (Dising the laser tracker, align 2.00 using the laser tracker, align 2.00 the fixture and on the walls. 2.01 Measure and of the tooling be 2.02 Scan the 'B' flange of the T 2.07 Remove Type-A coil from the coil for the coil f	PA Operations - Stations 1, 2, & 3 (1810)											
Assumes 5 day worky Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for statile parallel ops for sta 5 (Only 1 fixture for statile parallel ops for sta 5 (Only 1 fixture for statile parallel ops for sta 2 (FATION 2 TOTALION 2 TOTALION 2 TOTALION 2 TOTALION 2 TOTALION 2 TOTALION 3 TOTALION 4												
brication and Assembly sumptions: Assumes 5 day worky Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for statil Parallel ops for sta 2 (Parallel ops for sta												
Assumes 5 day worky Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 (Only 1 fixture for stati Parallel ops for sta 2 ATION 2 ——measauring and fitup checks 1.00 Mc fit-up pre-check and si 1.01 Verify that mating Mc's of a 1 his will include the Type-C 1.02 Epoxy paint all close fitting ii 2.00 Pre-measurement of McHi 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, algred to the state of the fixture and on the walls. 2.04 Measure all of the toling be 2.05 Scan the "B" flange of the Type-B "A" flange of the Type B" A" and Shim sizing / preparations 3.01 Using flange measurement of Surface grind a set of metal qualifications.	er. Wirke Viola											
Assumes 5 day worky Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for statil Parallel ops for sta 2 (Only 1 fixture for statil Parallel ops for sta 2 (ATION 2 (Emeasuring and fitup checks 1.00 MC fit-up pre-check and si 1.01 Verify that mating MC's of a 1 fix sill include the Type-C 1.02 Epoxy paint all close fitting ii 2.00 Pre-measurement of MCHI 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, algrent in the fixture and on the walls. 2.04 Measure all of the toling be 2.05 Scan the "B" lange of the Type-A coil from st 2.07 Remove Type-A coil from st 2.08 Measure Type A coil from st 2.09 Measure Type B "A" f 2.11 Measure Type C "A" fit Measure Type C "A" fit 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.												
Assumes 5 day worky Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 ATION 2	d Assembly						•					
Parallel ops for sta 5 (Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 ATION 2												
Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 Par	Assumes 5 day workweek 1 shift no overtime											
Parallel ops for sta 5 (Only 1 fixture for stati Parallel ops for sta 2 ATION 2	Parallel ops for sta 5 (2 fixtures available)											
Only 1 fixture for stati Parallel ops for sta 2 ATION 2 measauring and fitup checks 1.00 MC fit-up pre-check and si 1.01 Verify that mating MC's of a This will include the Type-C 1.02 Epoxy paint all close fitting in 2.00 Pre-measurement of MCHI 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, align 2.03 Estacush a gloost coordinate the fixture and on the walls. 2.04 Measure all of the tooling be 2.05 Scan the 18" flange of the T 2.07 Remove Type-A coil form st Measure Type A coil from st Measure Type B "A" fl 2.11 Measure Type C "A" fl 2.11 Measure Type A-A " A 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	Parallel ops for sta 5 (2 fixtures available)											
Parallel ops for sta 2 ATION 2 measauring and fitup checks 1.00	Only 1 fixture for station 3 only											
e-measauring and fitup checks 1.00 MC fit-up pre-check and st 1.01 Verify that mating MC's of a 1.01 This will include the Type-C 1.02 Epoxy paint all close fitting it 2.00 Pre-measurement of MCH 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, align 2.03 Establish a global coordinate 4.04 Measure all of the tooling ba 2.05 Scan the "B" flange of the Ty 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" f 2.11 Measure Type C "A"fl 2.14 Measure Type A- "A 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.												
e-measauring and fitup checks 1.00 MC fit-up pre-check and st 1.01 Verify that mating MC's of a This will include the Type-C. 1.02 Epoxy paint all close fitting is 2.00 Pre-measurement of MCHI 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, align 2.03 testablish a global coordinate 2.04 Measure all of the tooling be 2.05 Scan the "B" flange of the Ty 2.07 Remove Type-A coil from st Measure Type B "A" fl 2.11 Measure Type B "A" fl 2.11 Measure Type C "A" fl 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	·											checked with primave
1.01 Verify that mating MC's of a This will include the Type-C 1.02 Epoxy paint all close fitting in 2.00 Pre-measurement of MCHI 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, alignous the factor of the total coordinate the factor and the factor and on the walls. 2.03 Establish a global coordinate the factor and the factor and the total coordinate the factor and the walls. 2.04 Measure all of the tooling based on the "B" flange of the 1" 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" from Measure Type B "A" from Measure Type C "A" [1] 2.14 Measure Type C "A" [1] 3.00 Shim sizing / preparations 3.01 Using flange measurement of Surface grind a set of metal qualifications.	g and fitup checks											checked with primave
This will include the Type-C 1.02 Epoxy paint all close fitting in 2.00 Pre-measurement of MCHI 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, align 2.03 Establish a global coordinate the fixture and on the walls. 2.04 Measure all of the tooling be 2.05 Scan the "B" flange of the Ti 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" f Measure Type C "A" I Measure Type S "A" for String S S S S S S S S S S S S S S S S S S S	IC fit-up pre-check and surface insulation										Sequence Plan R5	checked with primave
1.02 Epoxy paint all close fitting is 2.00 Pre-measurement of MCHI 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, aligned a state of the total content of the tributer and on the walls. 2.03 Estate and on the walls. 2.04 Measure all of the tooling be 2.05 Scan the "B" flange of the Ty 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" f 2.11 Measure Type C "A"fl. 2.14 Measure Type A-A" A 3.00 Shim sizing / preparations 3.01 Using flange measurement of Surface grind a set of metal qualifications.	erify that mating MC's of a MCHP will come together without interferences by pre-fitting mating coils.		4.0					00	٥.			ale and and order and as a con-
2.00 Pre-measurement of MCHI 2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, align 2.03 Establish a global coordinate the fixture and on the walls. 2.04 Measure all of the tooling be 2.05 Scan the "B" flange of the Ti 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" f 2.11 Measure Type C "A" fl 2.14 Measure Type A-A "A 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	his will include the Type-C coil with its interfacing Period Type-C coil. poxy paint all close fitting interfacing surfaces.		4.0 3.0					80 60				checked with primave
2.01 Set the Type-A coil on the p 2.02 Using the laser tracker, align 2.03 Establish a global coordinate the fixture and on the walls. 2.04 Measure all of the tooling be 2.05 Scan the 'B' flange of the T) 2.07 Remove Type-A coil from st. 2.08 Measure Type B "A" fl 2.11 Measure Type B "A" fl 2.11 Measure Type C "A" fl 2.14 Measure Type Toparations 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	re-measurement of MCHP Type A, B and C coils flanges plus interfacing Type-A coil flange		3.0		1 1			60	2.5		2 at a time on the two 20 degree	checked with primaver
2.02 Using the laser tracker, alignost to the fixture and on the walls. 2.04 Measure all of the tooling be considered to the tracker alignost to the tooling be considered to the tracker and the tooling be considered to the tracker and tracker and the tracker and tracker and the tracker and	, , , , , , , , , , , , , , , , , , ,										wedges	checked with primaver
2.03 Establish a global coordinate the fixture and on the walls. 2.04 Measure all of the tooling be 2.05 Scan the IB* flange of the Ty 2.07 Remove Type-A coil from st. Measure Type B "A" fl. 2.11 Measure Type C "A" fl. 2.11 Measure Type C "A" fl. 2.14 Measure Type A-A" a Shim sizing / preparations 3.00 Shim sizing / preparations 3.01 Using flange measurement of Surface grind a set of metal qualifications.	et the Type-A coil on the pre-measurement fixture, "A" side flange down.		1.0					20	2.5		May be done early	checked with primaver
the fixture and on the walls. 2.04 Measure all of the tooling be 2.05 Scan the 'B' flange of the Ti 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" fl 2.11 Measure Type C "A" fl 3.00 Shim sizing / preparations 3.01 Using flange measurement 3.02 Surface grind a set of metal qualifications.	sing the laser tracker, align to the conical seats locking into a minimum of 8 of them.		2.0							40	Metrology Staff Budgeted as LOE	checked with primave
2.04 Measure all of the tooling be 2.05 Scan the "B" flange of the 1y 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" f 2.11 Measure Type C "A" fl 2.14 Measure Type A- "A 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	stablish a global coordinate system based on the modular coil geometry. Measure the monuments on		7.0							4.40	Metrology Staff Budgeted as LOE	ale and and additional account
2.05 Scan the "B" flange of the Ty 2.07 Remove Type-A coil from st 2.08 Measure Type B "A" fl 2.11 Measure Type C "A"fl 2.14 Measure Type A-A "A 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	leasure all of the tooling ball monuments on the winding form.		7.0							140	Metrology Staff Budgeted as LOE	checked with primave
2.07 Remove Type-A coil from st 2.08 Measure Type B "A" if 2.11 Measure Type C "A" ifi. 2.14 Measure Type A-A "A 3.00 Shim sizing / preparations 3.01 Using flange measurement 3.02 Surface grind a set of metal qualifications.			1.0							20	Metrology Staff Budgeted as LOE	checked with primave
2.08 Measure Type B "A" f 2.11 Measure Type C "A"ft 2.14 Measure Type A-A "A 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	temove Type-A coil from stand and move to holding area.		1.0					20	2.5	20	Metrology Stall Budgeted as LOL	checked with primaver
2.11 Measure Type C "A"fl. 2.14 Measure Type A-A "A 3.00 Shim sizing / preparations 3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	Measure Type B "A" flanges		14.0					40	2.5	220	Repeats 2.01-2.07	checked with primave
Shim sizing / preparations Using flange measurement of Surface grind a set of metal qualifications.	Measure Type C "A"flanges		13.0	ľ				40	2.5	220		checked with primave
3.01 Using flange measurement of 3.02 Surface grind a set of metal qualifications.	Measure Type A-A "A" flange		13.0					40	2.5	220	Repeats 2.01-2.07	checked with primave
3.02 Surface grind a set of metal qualifications.	him sizing / preparations										Sequence Plan R5	checked with primaver
qualifications.	sing flange measurement of the coils, define the A/A and A/B shim thickness.										Back Office	checked with primaver
	urface grind a set of metal shims that will be used on the first MCHP article for assembly process		4.0					00	2.5		Actual experience	ah a alva d with pri
4.00 Pre-Installation Station 2 s	ualifications. re-Installation Station 2 set-up recalibration		4.0	-				80	2.5		Sequence Plan R5	checked with primaver checked with primaver
	nstall MCHP fixtures and metrology equipment.		 	-				0	2.5		Sequence i ian its	checked with primaver
	erform metrology set-up and checks	66	2.0					U	2.5	40	Metrology Staff Budgeted as LOE	checked with primaver

WBS Nur	nber: 185														
	e: Assembly of Field Periods														
	pers: 1802, 1810, and 1815														
	FPA Oversight & Support (1802)														
	FPA Operations - Stations 1, 2, & 3 (1810)														
	FPA Operations - Station 5 (1815)														
Job Mana	ger: Mike Viola														
Fabrication :	and Assembly						1	-1	1	1					
Assumption															
	Assumes 5 day workweek 1 shift no overtime				• •	1	1	-	1						
	Parallel ops for sta 5 (2 fixtures available)														
	Parallel ops for sta 5 (2 fixtures available)														
	Only 1 fixture for station 3 only														
	Parallel ops for sta 2	1			+			1		1					
Assemble															checked with primavera
5.00	Pre-assemble A1-A2													Sequence Plan R5	checked with primavera
5.01	Position the Type-A modular coil on the fixture, "B" flange down. Obtain a set of "realigned" fiducial	_		<u> </u>					·					Metrology Staff Budgeted as LOE -	
	positions.	2.0	0								40			COMPLETED	checked with primavera
5.02	Align the laser tracker to the conical seats locking into a minimum of 8 of them.	1.0	0										20	Metrology Staff Budgeted as LOE	checked with primavera
5.03	Establish a global coordinate system based on the modular coil geometry. Measure the monuments on the fixture and on the walls.	2.0	0										40	Metrology Staff Budgeted as LOE	checked with primavera
5.04	Place the an initial set of metal shims on the coil in the designated locations, identical to those in the A1-													-9,	
	A2 fit up test.	0.5			\perp		1	1		1	10				checked with primavera
5.05 5.06	Install dial indicators on the modular coil in areas where we expect to see deflection. Lower the mating type A modular coil into position.	2.0			\vdash		1	-		1	40				checked with primavers
5.06	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necessary to bring displaced	1.0	U		+	-	1	1		1	20	2.5			checked with primavera
	monuments back to within .002" of their original position.	 1.0	~							<u></u>	20				checked with primavera
5.08	Using three target points, perform the positioning as was done in the A1-A2 fit up test.	1.0	0								20	2.5			checked with primavera
5.09	Install the remaining metal shims with Fuji paper, install studs, supernuts, and torque to 50% of final	2.0	n								40	2.5			checked with primavera
5.10	Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is											2.0			oncoxed with primavere
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and	1.0									20	2.5			ah a ak a di with in rimay are
5.11	recheck. Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	1.0	U								20	2.5			checked with primavera
	.007" or less.	5.0	0										100	Metrology Staff Budgeted as LOE	checked with primavera
5.12	If the above step does not fall within .007" or less then loosen all studs, adjust shims locally. Re-torque all studs to 50%.	3.0	0								60	2.5			checked with primavera
5.13	Loosen studs to extract Fuji paper. Evaluate shim pressure distribution and make shim adjustments if	3.0	U								00	2.5			checked with primavera
	shim pressure is unacceptable. Re-torque all studs to 50% and recheck alignment.														checked with primavera
5.14	Install the A-A locator bushings at two stud locations for use in re-positioning MCHP in Stage 3.	2.0									40				checked with primavera
5.15 6.00	Remove all studs, nuts, shims etc. Identify shim locations. A-B modular coil assembly	1.0	U								20	2.5		Sequence Plan R5	checked with primavera checked with primavera
6.01	Place the Type-A coil, "A" flange down, on the 20deg fixture. Obtain a set of "realigned" fiducial positions													ocquence i lan No	Checked with primavera
	for the "A" and "B" coils.	2.0									40	2.5			checked with primavera
6.02	Using the laser tracker, align to the conical seats locking into a minimum of 8 of them.	1.0	0										20	Metrology Staff Budgeted as LOE	checked with primavera
6.03	the fixture and on the walls.	2.0	0										40	Metrology Staff Budgeted as LOE	checked with primavera
6.04	Place the an initial set of metal shims on the coil in the designated locations.	2.0	0								40	2.5			checked with primavera
6.04.1	Stuff Shim Bag with Fiberglas, Reseal, Place Shim Bag on Wing													LED: Must place bag before coil	
		0.3									5			assembly	checked with primavera
6.05	Lower the Type-B coil onto the Type-A coil.	1.0	0		\sqcup		1			1	20	2.5			checked with primavera
6.06	Measure the monuments on the A coil. Jack areas of the coil as necessary to bring displaced monuments back to within .002" of their original position.	1.0	ol								20	2.5			checked with primavera
6.06.1	Install Dial indicators for X-Y Positioning	1.0	0							•	20			LED: Missing from sequence	checked with primavera
6.07	Using three target points on the B coil, perform the X-Y positioning of the B coil.	1.0	0					\perp			20	2.5			checked with primavera
6.08	Install the remaining metal shims with Fuji paper, install studs, supernuts, and torque to 50% of final	2.0									40	2.5			checked with primavera
6.09	value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is	2.0		+ - -	+			+			40	2.5			checked with primavera
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and	,	ا												ale and a service of
6.10	recheck. Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	1.0	U		Щ					1	20	2.5			checked with primavera
0.10	.007" or less.	5.0	0										100	Metrology Staff Budgeted as LOE	checked with primavera
6.11	If the above step does not fall within .007" or less then loosen all studs, adjust shims locally. Re-torque all														ale and a service of
6.12	studs to 50%. Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Re-	3.0	U	+	+	-	1	1	1	1	60	2.5			checked with primavera
	torque all studs to 50%.	1.0	0								20	2.5			checked with primavera
6.13	Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is														
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and recheck.	1.0	ol								20	2.5			checked with primavera
6.14	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be											0	_		ta di Para di
	.007" or less.	5.0	0										100	Metrology Staff Budgeted as LOE	checked with primavera

WBS Nur	nber: 185															
	e: Assembly of Field Periods															
	bers: 1802, 1810, and 1815															
	FPA Oversight & Support (1802)															
	FPA Operations - Stations 1, 2, & 3 (1810)															
	FPA Operations - Station 5 (1815)															
Job Mana	ager: Mike Viola															
	and Assembly															
Assumption	S:															
	Assumes 5 day workweek 1 shift no overtime															
	Parallel ops for sta 5 (2 fixtures available)															
	Parallel ops for sta 5 (2 fixtures available)															
	Only 1 fixture for station 3 only															
6.15	Parallel ops for sta 2 If the above step does not fall within .007* or less then loosen all studs, adjust shims locally. Re-torque all															
	studs to 50%.		3.0									60	2.5			checked with primavera
6.16	One hole at a time, remove the supernut. Using the eccentric gage slid onto the stud define the hole eccentricity. Select bushing and machine to match required eccentricity. Install bushing, Replace nut and tighten back to 50% and recheck alignment. Total 10 days 7 days to pre fit & fab bushings (in parallel with other tasks) and 3 days to install		10.0									200) 2.5		LED: Technical Issue space in some areas is insufficient to remove nuts with flanges in position. If there is space duration should be 1.5 days	
6.17	Complete tightening of flange bolts to 100%.		1.0									20	2.5			checked with primavera checked with primavera
6.18	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be		1.0										2.5			<mark>-</mark>
	.007" or less.		2.0											40	Metrology Staff Budgeted as LOE	checked with primavera
6.19 6.20	Scan the "B" flange of Type-B coil Using the "B" flange measurement of the Type-B coil and the earlier "A" flange measurement of the Type-		1.0									20	2.5	1		checked with primavera
	C coil, define all B/C flange shim thickness.														Back office	checked with primavera
7.00	(A-B) to C modular coil assembly (MCHP) Place the "A/B" assembly, "A" coil down, on the 40deg fixture. Obtain a set of "realigned" fiducial positions.														Sequence Plan R5	checked with primavera
7.01	For the "A", "B", and "C" coils.		3.0									60	2.5			checked with primavera
7.02	Using the laser tracker, align to the conical seats locking into a minimum of 8 of them.		1.0											20	Metrology Staff Budgeted as LOE	checked with primavera
7.03	Establish a global coordinate system based on the modular coil geometry. Measure the monuments on the fixture and on the walls.		2.0											40	Metrology Staff Budgeted as LOE	checked with primavera
7.04	Place the an initial set of metal shims on the coil in the designated locations.		2.0			_						40	2.5	40 :l	Metrology Stall Budgeted as LOL	checked with primavera
7.05	Lower the Type-C coil onto the Type-B coil.		1.0									20	2.5			checked with primavera
7.06	Measure the monuments on the A coil to evaluate monument displacements. If movement greater than .002' is observed discuss with back office on how to proceed in bringing displaced monuments back to within .002' of their original position.		1.0											20		checked with primavera
6.06.1	Install Dial indicators for X-Y Positioning		1.0				,					20			LED: Missing from sequence	checked with primavera
7.07	Using three target points on the Type-C coil, perform the X-Y positioning of the coil.		1.0									20	2.5			checked with primavera
7.08	Install the remaining metal shims with Fuji paper, install studs, supernuts, and torque to 50% of final value.		2.0									40	2.5	;		checked with primavera
7.09	Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and recheck.		1.0									20	2.5			checked with primavera
7.10	Measure the tooling balls on all coils. The maximum deviation from the "realigned" points should be .010"		F 0						<u> </u>			_		100	Metrology Staff Budgeted as LOE	ah a aka d with prior
7.11	or less. If the above step does not fall within .010" or less then loosen all studs, adjust shims locally. Re-torque all		5.0											100	metrology stall budgeted as LOE	checked with primavera
	studs to 50%.		3.0									60	2.5	i		checked with primavera
7.12	Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Retorque all studs to 50%.	l	1.0									20	2.5			checked with primavera
7.13	Make a hand viggle' test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and recheck.		1.0									20				checked with primavera
7.14	Measure the tooling balls on all coils. The maximum deviation from the "realigned" points should be .010"			1		-	1									
7.15	or less. If the above step does not fall within .010* or less then loosen all studs, adjust shims locally. Re-torque all		5.0		\vdash			-			1	100	2.5	-		checked with primavera
7.15	studs to 50%.		3.0									60	2.5			checked with primavera
****	One hole at a time, remove the supernut. Using the eccentric gage slid onto the stud define the hole eccentricity. Select bushing and machine to match required eccentricity. Install bushing. Replace nut and tighten back to 50% and recheck alignment. Total 10 days 7 days to pre fit & fab bushings (in parallel with		10.0									200			LED: Increase duraction to 1.5	shocked with a rimer
7.17	other tasks)and 3 days to install Complete tightening of flange bolts to 100%.		1.0									200			LED. Increase duraction to 1.5	checked with primavera checked with primavera
11.01	Install or identify three primary fiducials that will be used in positioning the Period in Station 3.		1.0				+	+				20				checked with primavera
7.18	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be									1			0			
	.010" or less. Make final metrology measurement of all fiducials. Scan the "B" flange of Type-C coil. Record the results.		5.0											100	Metrology Staff Budgeted as LOE	checked with primavera
	Tack weld inboard welded shims														Sequence Plan R5	checked with primavera
8.00										+			1	1		
8.00 8.01	Partially tack weld all inboard shims to one flange to keep them in place. The final welding of all welded shims to take place in Station 3.		2.0									40	2.5		Perform at A-B also	checked with primavera

WBS Number	r: 185									
WBS Title: As	ssembly of Field Periods									
	s: 1802, 1810, and 1815									
	A Oversight & Support (1802)									
	A Operations - Stations 1, 2, & 3 (1810)									
	A Operations - Station 5 (1815)									
Job Manager:										
JOD Wanager	. WIRE VIOIA									
abrication and A	ssembly			-		1				
Assumptions:										
Ass	umes 5 day workweek 1 shift no overtime									
Para	allel ops for sta 5 (2 fixtures available)									
Para	allel ops for sta 5 (2 fixtures available)									
Only	y 1 fixture for station 3 only									
	allel ops for sta 2									
	Il trim coil on the top surface of the Type-C on Period 1 and 2 only on the MCHP - Right Side (See	6.0					120	2.5		checked with primavera
	re 3 below). plete local service and interface details	6.0					120	2.5	Sequence Plan R5	checked with primavera
	Il all wing support bladders between wing surfaces (A/B, B/C) and on the C wing (MCHP - Right Side								Sequence Fian No	checked with primavera
only)		2.0					40	2.5	LED: Bags were placed earlier	checked with primavera
10.02 Make	e local service runs/connections on the shell of each MC.								4 days for coolant lines 4 days for	
									mod coils thermocouples and strain	
		8.0					160	2.5	gages terminations	checked with primavera
	t stycast or some compound to fill in all shim spaces in order to prevent VV/MC insulation from falling	1.0					20	2.5		checked with primavera
out. 11.00 Final	I measurements / transfer completed MCHP to holding area	1.0					20	2.5	Seguence Plan R5	checked with primavera
	e final metrology measurement of all fiducials. Scan the "B" flange of Type-C coil. Record the results.			+						
	• • • • • • • • • • • • • • • • • • • •						0	2.5	Done at 7.18	checked with primavera
	g tension tester measure bolt length on all tension fasteners and record the results.	0.5					10	2.5		checked with primavera
	part for identification	0.0					0	2.5		checked with primavera
	Il lift support beams	2.0					40	2.5		checked with primavera
	ove from stand and measure weight of completed assembly	1.0					20	2.5		checked with primavera
11.07 Move	e to holding area.	0.0					0	2.5	246 shifts	checked with primavera

IM/DC NI	phore 19E															
WBS Num						+										
	: Assembly of Field Periods					\perp										
Job Numb	pers: 1802, 1810, and 1815															
Job Title:	FPA Oversight & Support (1802)															
Job Title:	FPA Operations - Stations 1, 2, & 3 (1810)															
	FPA Operations - Station 5 (1815)															
	ger: Mike Viola															
JOD Walla	ger. Wirke viola					+										
Fabrication a	nd Assembly															
Assumptions																
	Assumes 5 day workweek 1 shift no overtime							1	'							
	Parallel ops for sta 5 (2 fixtures available)				1											
	Parallel ops for sta 5 (2 fixtures available) Only 1 fixture for station 3 only															
	Parallel ops for sta 2					+										
	A1,B1,C1 subtotal task 5-11 (total elasp time		126						l l			2125		740		also also disciplination assessment
Station 2 De	roduction Articles (HPA) and second half of FP #1 A2,B2,C2		120									2123		740	Sequence Plan R5	checked with primavera checked with primavera
1.00	MC fit-up pre-check and surface insulation			1					1						Sequence Plan R5	checked with primavera
1.01	Verify that mating MC's of a MCHP will come together without interferences by pre-fitting mating coils.					+										checked with primavera
	This will include the Type-C coil with its interfacing Period Type-C coil.		4.0									80	2.5			checked with primavera
1.02	Epoxy paint all close fitting interfacing surfaces.		3.0									60	2.5			checked with primavera
2.00	Pre-measurement of MCHP Type A, B and C coils flanges plus interfacing Type-A coil flange								T			·	Ţ		Sequence Plan R5	checked with primavera
2.08	Measure Type B "A" flanges		14.0			1						40	2.5	220	Repeats 2.01-2.07	checked with primavera
2.11	Measure Type C "A"flanges		13.0									40	2.5	220	Repeats 2.01-2.07	checked with primavera
2.14	Measure Type A-A "A" flange		13.0									40	2.5	220	Repeats 2.01-2.07	checked with primavera
3.00	Shim sizing / preparations														Sequence Plan R5	checked with primavera
3.01	Using flange measurement of the coils, define the A/A and A/B shim thickness.														-	checked with primavera
3.02	Compress alumina coated shims and sort by thickness the shim set that will be installed on the MCHP.				,	•							'		M	and the second second
4.00	Pre-Installation Station 2 set-up recalibration		4.0									80	2.5		May need more shims Sequence Plan R5	checked with primavera
4.00	Install MCHP fixtures and metrology equipment.											0	2.5		Sequence Flan KS	checked with primavera
4.02	Perform metrology set-up and checks	53 N	2.0									U	2.5	40	Metrology Staff Budgeted as LOE	checked with primavera checked with primavera
5.00	Pre-assemble A-A (Needs to be done total of 3 timee A1-A2, A3-A4, A5-A6)	33.0	2.0											40	metrology oftan Budgeted as LOL	checked with primavera
5.01	Position the Type-A modular coil on the fixture, "B" flange down. Obtain a set of "realigned" fiducial															checked with philiavera
	positions.															checked with primavera
5.02	Align the laser tracker to the conical seats locking into a minimum of 8 of them.															checked with primavera
5.03	Establish a global coordinate system based on the modular coil geometry. Mea the fixture and on the walls.															checked with primavera
5.04	Place all alumina and grind inboard weld shims on the coil.			_	-							_				onconca with primavera
5.05						7	\		1 1/ V							checked with primavera
5.05	Install dial indicators on the modular coil in areas where we expect to see defi		/ Y		/ \	/	\	/ \	, r	· / \						checked with primavera
5.05 5.06	Install dial indicators on the modular coil in areas where we expect to see defliction. Lower the mating type A modular coil into position.		'		/ \	/ _		/ _ \		\bigvee	M V					checked with primavera checked with primavera checked with primavera
5.155	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necessing displace									V_{Δ}	$\setminus \setminus$					checked with primavera checked with primavera
5.06 5.07	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess and g displace monuments back to within .02° of their original position.							5			$\setminus \setminus$					checked with primavera checked with primavera checked with primavera
5.06 5.07 5.08	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess to go displace monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 1							2			$\setminus \setminus$					checked with primavera checked with primavera checked with primavera checked with primavera
5.06 5.07 5.08 5.09	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess of monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A21 install studs, supernuts, and torque to 50% of final value.										\mathbb{N}					checked with primavera checked with primavera checked with primavera
5.06 5.07 5.08	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess to go displace monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 1															checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess for monuments back to within .02° of their original position. Using three target points, perform the positioning as was done in the A1-A2 I and I mistall studs, supernuts, and torque to 50% of final value. Make a hand 'wiggle' test (rotate on bott) on all shims to make sure that the found back off on sufficient adjacent botts to allow a replacement shim to be righten if															checked with primavera checked with primavera checked with primavera checked with primavera
5.06 5.07 5.08 5.09	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess to monuments back to within. 2002' of their original position. Using three target points, perform the positioning as was done in the A1-A2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1)) 									checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess to the monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bott) on all shims to make sure that the found back off on sufficient adjacent botts to allow a replacement shim to be techeck. Measure the tooling balls on both coils. The maximum deviation from the ingreed its short poor of the second of the seco)) 									checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess in monuments back to within .002" of their original position. Using three larget points, perform the positioning as was done in the A1-A2 1 linstall studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the 1 med 1 lts shq 2007" or less. If the above step does not fall within .007" or less then loosen all studs, adjust shims locally. Re-torque all studs to 50%.)									checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess from the monuments back to within .02° of their original position. Using three target points, perform the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning as was done in the A1-A2 that is the positioning MCHP in the A1-A2 that is the positioning MCHP in the A1-A2 that is the positioning MCHP in Stage 3.						7									checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess to morniments be act to within. 2002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 I will install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test fortate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be techeck. Measure the tooling balls on both coils. The maximum deviation from the "incomplete the tool of the student of the s						7								Security Disc DE	checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess to monuments back to within. 2002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 to linstall studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found" of ress. If a loos gitten it recheck. Measure the tooling balls on both coils. The maximum deviation from the "found" of ress. If a loos gitten it recheck. It is shown that the shown the shown that the found is shown that the found is shown that the found is shown that the shown that the found is shown that th						7								Sequence Plan R5	checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .02° of their original position. Using three target points, perform the positioning as was done in the A1-A2 in the state of the coil as necess was a state of the coil as the		1.0				<u> </u>					20	2.5		Sequence Plan R5	checked with primavera checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess to monuments back to within. 2002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 to linstall studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found" of ress. If a loos gitten it recheck. Measure the tooling balls on both coils. The maximum deviation from the "found" of ress. If a loos gitten it recheck. It is shown that the shown the shown that the found is shown that the found is shown that the found is shown that the shown that the found is shown that th						7						2.5	20	Sequence Plan R5 Metrology Staff Budgeted as LOE	checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess from monuments back to within. 2002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 I list all studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the tooling balls on both coils. The maximum deviation from the "incomplete the balls on both coils. The maximum deviation from the "incomplete the balls on both coils. The maximum deviation from the "incomplete the balls on both coils." It is loss to discuss the deviation from the "incomplete the the tooling discuss th		1.0				7						2.5	20	Metrology Staff Budgeted as LOE	checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02 6.03	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .02° of their original position. Using three target points, perform the positioning as was done in the A1-A2 land install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent both so allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient and the		1.0 1.0 2.0)) 					20		20 40	•	checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02 6.03	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .02° of their original position. Using three target points, perform the positioning as was done in the A1-A2 land material translations, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "I land off off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "I land off off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "I land off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "I land off on sufficient adjacent bolts to sufficient and sufficient shims locally. Re-torque all studs to 50%. Install the A-A locator bushings at two stud locations for use in re-positioning MCHP in Stage 3. Remove all studs, nuts, shims etc. Identify shim locations. A-B modular coil assembly Place the Type-A coil, "A" flange down, on the 20deg fixture. Obtain a set of "realigned" fiducial positions for the "A" and "B" coils. Using the laser tracker, align to the conical seats locking into a minimum of 8 of them. establish a global coordinate system based on the modular coil geometry. Measure the monuments on the future and on the walls. Place all allumina and grind inboard weld shims on the coil.		1.0				7					20	2.5	20 40	Metrology Staff Budgeted as LOE	checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .02° of their original position. Using three target points, perform the positioning as was done in the A1-A2 land install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that the found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent both so allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient adjacent bolts to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back off on sufficient and the		1.0 1.0 2.0 2.0				7					20	2.5	20 40	Metrology Staff Budgeted as LOE Metrology Staff Budgeted as LOE LED: Must place bag before coil	checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02 6.03 6.04 6.04.1	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess from monuments back to within. 2002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning balls on both coils. The maximum deviation from the modular coil as seembly as the positioning model. The positioning model is the positioning model in the A1-A1 locator bushings at two stud locations for use in re-positioning MCHP in Stage 3. Remove all studs, nuts, shims etc. Identify shim locations. A-B modular coil assembly Place the Type-A coil, "A1 fiange down, on the 20deg fixture. Obtain a set of "realigned" fiducial positions for the "A1-A2 I list of the A1-A2 I li		1.0 1.0 2.0 2.0)					20 40 5	2.5	20 40	Metrology Staff Budgeted as LOE	checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02 6.03 6.04 6.04.1	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .02" of their original position. Using three target points, perform the positioning as was done in the A1-A2 and the state of the coil as necess monuments back to within .02" of their original position. Using three target points, perform the positioning as was done in the A1-A2 and the state of the coil as the c		1.0 1.0 2.0 2.0				7	2				20	2.5	20 40	Metrology Staff Budgeted as LOE Metrology Staff Budgeted as LOE LED: Must place bag before coil assembly	checked with primavera
5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02 6.03 6.04	Lower the mating type A modular coil into position. Measure the monuments on the bottom coil. Jack areas of the coil as necess from monuments back to within. 2002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning as was done in the A1-A2 I list of the positioning balls on both coils. The maximum deviation from the modular coil as seembly as the positioning model. The positioning model is the positioning model in the A1-A1 locator bushings at two stud locations for use in re-positioning MCHP in Stage 3. Remove all studs, nuts, shims etc. Identify shim locations. A-B modular coil assembly Place the Type-A coil, "A1 fiange down, on the 20deg fixture. Obtain a set of "realigned" fiducial positions for the "A1-A2 I list of the A1-A2 I li		1.0 1.0 2.0 2.0				7					20 40 5 20	2.5	20 40	Metrology Staff Budgeted as LOE Metrology Staff Budgeted as LOE LED: Must place bag before coil	checked with primavera

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WBS Nun	nber: 185											
	: Assembly of Field Periods											
	pers: 1802, 1810, and 1815											
	FPA Oversight & Support (1802)											
	FPA Operations - Stations 1, 2, & 3 (1810)					1						
	FPA Operations - Station 5 (1815)											
	ger: Mike Viola											
JOD Walla	ger. Wirke viola											
	nd Assembly											
Assumptions	8											
	Assumes 5 day workweek 1 shift no overtime											
	Parallel ops for sta 5 (2 fixtures available)											
	Parallel ops for sta 5 (2 fixtures available)											
	Only 1 fixture for station 3 only											
	Parallel ops for sta 2											
6.07	Using three target points on the B coil, perform the X-Y positioning of the B coil. Install studs, supernuts, and torque to 50% of final value.	1.0 2.0						40	2.5	20	Metrology Staff Budgeted as LOE	checked with primavera checked with primavera
6.09	Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is	2.0	1	\vdash			1	40	2.5			checked with primavera
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and recheck.	1.0						20	2.5			checked with primavera
6.10	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be .007" or less.	5.0								100	Metrology Staff Budgeted as LOE	checked with primavera
6.11	If the above step does not fall within .007" or less then loosen all studs, adjust shims locally. Re-torque all											
6.12	studs to 50%. One hole at a time, remove the supernut. Using the eccentric gage slid onto the stud define the hole	3.0						60	2.5			checked with primavera
0.12	eccentricity. Select bushing and machine to match required eccentricity. Install bushing. Replace nut and tighten back to 50% and recheck alignment. Total 10 days 7 days to pre fit & fab bushings (in parallel with							000	0.5		LED: See above	
6.13	other tasks) and 3 days to install Complete tightening of flange bolts to 100%.	10.0 1.0			ĺ	1	1	200			LED: See above	checked with primavera
6.14	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	1.0						20	2.5			checked with primavera
	.007" or less.	3.0		 						60	Metrology Staff Budgeted as LOE	checked with primavera
6.15	Scan the "B" flange of Type-B coil	1.0						20	2.5			checked with primavera
6.16	Using the "B" flange measurement of the Type-B coil and the earlier "A" flange measurement of the Type-C coil, define all B/C flange shim thickness.											checked with primavera
7.00	(A-B) to C modular coil assembly (MCHP)										Sequence Plan R5	checked with primavera
7.01	Place the "A/B" assembly, "A" coil down, on the 40deg fixture. Obtain a set of "realigned" fiducial positions. For the "A", "B", and "C" coils.	2.0						40	2.5			checked with primavera
7.02	Using the laser tracker, align to the conical seats locking into a minimum of 8 of them.	1.0						40	2.0	20	Metrology Staff Budgeted as LOE	checked with primavera
7.03	Establish a global coordinate system based on the modular coil geometry. Measure the monuments on the fixture and on the walls.	2.0								40	Metrology Staff Budgeted as LOE	checked with primavera
7.04	Place all alumina and grind inboard weld shims on the coil.	2.0						40				checked with primavera
7.05 7.06	Lower the Type-C coil onto the Type-B coil. Measure the monuments on the A coil to evaluate monument displacements. If movement greater than	1.0						20	2.5			checked with primavera
	.002" is observed discuss with back office on how to proceed in bringing displaced monuments back to within .002" of their original position.	1.0								20	Metrology Staff Budgeted as LOE	checked with primavera
7.07	Using three target points on the Type-C coil, perform the X-Y positioning of the coil.	1.0						20				checked with primavera
7.08 7.09	Install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is	2.0		\vdash				40	2.5			checked with primavera
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and recheck.	1.0						20	2.5			checked with primavera
7.10	Measure the tooling balls on all coils. The maximum deviation from the "realigned" points should be .010" or less.	5.0								100	Metrology Staff Budgeted as LOE	checked with primavera
7.11	One hole at a time, remove the supernut. Using the eccentric gage slid onto the stud define the hole eccentricity. Select bushing and machine to match required eccentricity. Install bushing. Replace nut and tighten back to 50% and recheck alignment. Total 10 days 7 days to pre fit & fab bushings (in parallel with											
	other tasks)and 3 days to install	10.0					,	200			LED: See above	checked with primavera
7.12 7.13	Complete tightening of flange bolts to 100%.	1.0						20	2.5			checked with primavera
1.13	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be .010" or less.	4.0								80	Metrology Staff Budgeted as LOE	checked with primavera
8.00	Tack weld inboard welded shims										Sequence Plan R5	checked with primavera
8.01	Partially tack weld all inboard shims to one flange to keep them in place. The final welding of all welded shims to take place in Station 3.	1.0						20	2.5			checked with primavera
9.00	Install trim coil	1.0				1		20	2.0		Sequence Plan R5	checked with primavera
9.01	Install trim coil on the top surface of the Type-C on Period 1 and 2 only on the MCHP - Right Side (See					1					-	
10.00	Figure 3 below).	6.0		\vdash		1		120	2.5		Seguence Plan PF	checked with primavera
10.00	Complete local service and interface details Inflate all wing support bladders between wing surfaces (A/B, B/C) and on the C wing (MCHP - Right Side										Sequence Plan R5	checked with primavera
	only).	2.0						40	2.5		See above	checked with primavera
10.02	Make local service runs/connections on the shell of each MC.										4 days for coolant lines 4 days for mod coils thermocouples and strain	
		8.0		Ш				160	2.5		gages terminations	checked with primavera

WBS Num	nber: 185									
WBS Title	: Assembly of Field Periods									
Job Numb	pers: 1802, 1810, and 1815									
Job Title:	FPA Oversight & Support (1802)									
Job Title:	FPA Operations - Stations 1, 2, & 3 (1810)									
Job Title:	FPA Operations - Station 5 (1815)									
Job Mana	ger: Mike Viola									
Enhrication a	and Assembly									
Assumptions										
	Assumes 5 day workweek 1 shift no overtime									
	Parallel ops for sta 5 (2 fixtures available)									
	Parallel ops for sta 5 (2 fixtures available)									
	Only 1 fixture for station 3 only									
	Parallel ops for sta 2									
10.03	Inject stycast or some compound to fill in all shim spaces in order to prevent VV/MC insulation from falling out.	1.0				20	2.5			checked with primavera
11.00	Final measurements / transfer completed MCHP to holding area								Sequence Plan R5	checked with primavera
11.01	Install or identify three primary fiducials that will be used in positioning the Period in Station 3.	1.0				20	2.5			checked with primavera
11.02	Make final metrology measurement of all fiducials. Scan the "B" flange of Type-C coil. Record the results.	5.0						100	Metrology Staff Budgeted as LOE	checked with primavera
11.03	Using tension tester measure bolt length on all tension fasteners and record the results.	0.5				10	2.5			checked with primavera
11.04	Mark part for identification	0.0					2.5			checked with primavera
11.05	Install lift support beams	2.0					2.5			checked with primavera
11.06	Remove from stand and measure weight of completed assembly and Move to holding area.	2.0					2.5			checked with primavera

WBS Number:	185															
	sembly of Field Periods															
	: 1802, 1810, and 1815															
	Oversight & Support (1802)															
	A Operations - Stations 1, 2, & 3 (1810)															
	1 , , , ,															
	Operations - Station 5 (1815)															
Job Manager:	MIKE VIOIA															
Fabrication and Ass	ssembly					-				1						
Assumptions:																
Assu	umes 5 day workweek 1 shift no overtime															
	llel ops for sta 5 (2 fixtures available)															
Paral	llel ops for sta 5 (2 fixtures available)					•										
	1 fixture for station 3 only															
	llel ops for sta 2															
	B2,C2 Subtotal task 5-11 (total elasp time)		83									1335		620		checked with primavera
	Coil Subassembly-FP#2					1	<u> </u>		1	<u> </u>	<u> </u>	0.46-				checked with primavera
	mble/Align Mod-Coils A3/B3/C3		126									2125		740	Sequence Plan R5	checked with primavera
Asser	mble/Align Mod-Coils A4/B4/C4		83									1335		620	Sequence Plan R5	checked with primavera
Station 2-Modular C	Coil Subassembly-FP#3	「														checked with primavera
Asser	mble/Align Mod-Coils A5/B5/C5		126									2125		740	Sequence Plan R5	checked with primavera
Asser	mble/Align Mod-Coils A6/B6/C6		83									1335		620	Sequence Plan R5	checked with primavera
	-														-	checked with primavera
	e Mod Coils and VVSA-FP#1															checked with primavera
	Hardware			\$ 5.0												checked with primavera
	ure and load test 3 legged actuator System		4.0									96	3.0			checked with primavera
	ure, Fabricate and load test 3 legged actuator Lift Fixture n Assembly of First Field Period Assy		8.0 2.0	\$ 6.0k								128 40	2.0			checked with primavera
	new platform legs		4.0									64	2.0			checked with primavera
Install	Il station 3 platforms (8 required)		4.0	\$ 10.0k								112	3.5			checked with primavera
Test o	out station 3 equipment and procedures			\$ 10.0								0	2.5			checked with primavera
	Assembly Step															checked with primavera
1.00 Pre-Ins	Assembly Step															checked with primavera
	Station 3 site monuments as needed to perform metrology measurements.		3.0	\$ 2.01								60	2.5			checked with primavera
	floor mounted tracks and VV base support			\$ 1.0k								100	2.5			checked with primavera
	gging operations to establish the MCHP CG location.		2.0									40	2.5			checked with primavera
	ssemble left MCHP MCHP support cart assemblies		4.0									0 80	2.5 2.5			checked with primavera checked with primavera
	cart motion. Move left cart to final assembly position to accept left MCHP and secure to the floor	-														checked with philiavera
suppor	rts. Move right cart far to the right.		2.0		$\perp \perp$							40	2.5			checked with primavera
	adjustor bar support weldment on Left Side the SISSCO crane, position left MCHP on the cart assembly		0.0 1.0		\perp	-			1			20	2.5			checked with primavera
	e left MCHP at three location to vertical support posts on support cart base.	-+	2.0		+	1		1	1			40				checked with primavera
2.06 Measu	ure the monuments on the positioned left MCHP and on the walls to establish the machine						·				'			100	Motrology Stoff Budgeted of LOT	ta di Para di
2.07 Set the	inate for further assembly operations. e positioning stop on the cart so it returns to the machine coordinate defined position in further		5.0											100	Metrology Staff Budgeted as LOE	checked with primavera
asseml	nbly steps.		1.0									20	2.5			checked with primavera
	ssemble right MCHP											0	2.5		·	checked with primavera
	the right base support cart to its final position ready to accept the right MCHP. Position the AirLoc emount in a lowered position.		0.5									10	2.5			checked with primavera
3.02 Lift the	e right side MCHP using the SISSCO crane and position it to be ready to engage the preinstalled								1							
Type-A 3.03 Tempo	A flange guide bushings. orary fasteners located adjacent to the alignment bushings can be used to help bring the parts		1.0		+							20	2.5			checked with primavera
togethe	ner.		0.0									0	2.5			checked with primavera
	held by the crane bring the AirLoc Wedgemount leveler up to take the load.		0.0									0	2.5			checked with primavera
	temporary scaffolding to install flange hardware bolts and shims as needed for assembly tolerances.	-+	1.0		+			-	1		-	20 20				checked with primavera
	en flange fasteners to 50%	 -	1.0						1			20				checked with primavera
3.08 Perform	m metrology measurements of all alignment fiducials on both MCHP's. The maximum deviation		1.0			4		_		<u> </u>		20	2.0		Matalana 01-# Budantada 1 05	ta di Para di
from th	he reference points should be .020" or less.		5.0											100	Metrology Staff Budgeted as LOE	checked with primavera
	m position adjustments on the right side MCHP if needed. Loosen all studs, adjust AirLock emounts as needed and install alternate sized shims. Re-torque all studs to 50% and recheck.															
	·		2.0			1			1		<u> </u>	40	2.5			checked with primavera
	position of the VV support hanger locations (top and bottom) on the left and right MCHP. May be		3.0											60	Metrology Staff Budgeted as LOE	checked with primavera
done a	as part of 3.08 if 3.09 not needed		5.0	_												

WBS Nur	nber: 185													
	e: Assembly of Field Periods													
	bers: 1802, 1810, and 1815													
	FPA Oversight & Support (1802)													
	FPA Operations - Stations 1, 2, & 3 (1810)													
	FPA Operations - Station 5 (1815)													
Job Mana	ager: Mike Viola													
ahrication	and Assembly													
Assumption														
	Assumes 5 day workweek 1 shift no overtime							l.						
	·					ı		1						
	Parallel ops for sta 5 (2 fixtures available)													
	Parallel ops for sta 5 (2 fixtures available)													
	Only 1 fixture for station 3 only Parallel ops for sta 2													
4.00	Install laser screens		\$ 2.0K											checked with primavera
4.01	Establish a global coordinate system based on the full period geometry. Measure the monuments on the	 	Ψ 2.0IC			 			·			·		<mark>-</mark>
	MCHP's and on the walls.	2.0										40	Metrology Staff Budgeted as LOE	checked with primavera
4.02	Using metrology and the established global coordinate system place all of the laser screens as called out in the Stage 3 drawings.	 2.0								40	2.5			checked with primavera
4.03	Turn each lasers on and with metrology determine their alignment. Record the laser position.	1.0								20	2.5			checked with primavera
4.04	Based on metrology measurements of the screens and lasers the screens path can be defined by the	0												
4.05	back office. Print the path on milar paper and using metrology mount the milar on the screens.						ļ			0	2.5			checked with primavera
4.05 4.06	Disengage the MCHP's by using the left support and adjustor bar to move the left MCHP. Remove both MCHP's.	1.0			\vdash				-	20	2.5	1	Can these stay on the carts and be	checked with primavera
4.00	Inciliate bout mortil. 3.	2.0								40	2.5	;	rolled all the way back?	checked with primavera
5.00	Install vacuum vessel	2.0								0	2.5		Tolica all the way back.	checked with primavera
5.01	Remove the adjustor bar support from left side.	0.0								0	2.5			checked with primavera
5.02	Install VV NBI port support stand.	2.0								40				checked with primavera
5.03	Install VVSA to base support and make the connection to the NBI port attachment.	1.0								20	2.5	5		checked with primavera
5.04	Using metrology take tooling ball readings off the VV shell to properly position the VVSA to the global coordinate system. Secure the VVSA to the base and at the NBI port support stand.	2.0								40	2.5			ah a alva d with primayara
6.00	Install left MCHP over VV	2.0								0	2.5			checked with primavera checked with primavera
6.01	Install any bumper protection components on the VV (left and right side) before manipulating left MCHP													checked with primavera
	over the VV.	0.5								10	2.5	5		checked with primavera
6.02	Move the left base support cart to the far left so it will not interfere with the MCHP installation. Position the AirLoc Wedgemount in a lowered position.	0.0								0	2.5	,		checked with primavera
6.03	Using the SISSCO actuators with laser guidance move the left MCHP over the VV.	2.0								40				checked with primavera
6.04	Re-install the left adjustor bar.	0.0								0	2.5			checked with primavera
6.05	Once the MCHP has been moved over the VV bring up Wedgemount levelers to stabilize the unit and take									40				and the same of
6.06	metrology measurements. Make position adjustments to properly align the MCHP. Transfer the full load to the AirLoc Wedgemount leveler.	2.0								40	2.5			checked with primavera
6.07	Using the adjustor bar on the left side move the MCHP to the left 1/2".	0.0								0	2.5			checked with primavera
7.00	Install right MCHP over VV	0.0								0	2.5			checked with primavera
7.01	Move the right base support cart to the far right so it will not interfere with the MCHP installation. Position													
7.02	the AirLoc Wedgemount in a lowered position. Using the SISSCO actuators with laser guidance move the right MCHP over the VV TO WITHIN 1/2" OF	0.0			\vdash				-	0	2.5	1		checked with primavera
1.02	ITS FINAL POSITION and pause. Go to the next step.	2.0								40	2.5	5		checked with primavera
7.03	Using the adjustor bar on the left side move the left MCHP to its final position.	0.5								10	2.5	5		checked with primavera
7.04	With the left MCHP in place, move the right side MCHP using the CISSCO crane and position it to be ready to engage the preinstalled Type-A flange guide bushings.	0.5								10	2.5			checked with primavera
7.05	ready to engage the preinstalled Type-A flange guide bushings. Temporary fasteners located adjacent to the alignment bushings can be used to help bring the parts	0.5								10	2.5	1		checked with primavera
	together.	0.0								0	2.5			checked with primavera
7.06	While held by the crane bring the AirLoc Wedgemount leveler up to take the load.	0.5								10				checked with primavera
7.07 7.08	Remove the laser screens to provide more floor space for scaffolding. Install temporary scaffolding to install flange hardware	0.0 4.0					-			0	2.5			checked with primavera
7.08	Install temporary scarfolding to install flange hardware Install bolts and all alumina and inboard weld shims.	4.0 2.0		_	\vdash					80 40	2.5			checked with primavera
7.10	Tighten flange fasteners to 50%	1.0		_	\vdash					20	2.5			checked with primavera
7.11	Make a hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is	1.0								20	2.0	1		
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and	4.0									٠,			about adjusts print
7.12	recheck. Perform metrology measurements of all alignment fiducials on both MCHP's. The maximum deviation	1.0								20	2.5	2		checked with primavera
1.12	from the reference points should be .020" or less.	5.0										100	Metrology Staff Budgeted as LOE	checked with primavera
7.13	Perform position adjustments on the right side MCHP if tolerance is not met. Loosen all studs, adjust													
	AirLock Wedgemounts as needed; install alternate sized shims. Re-torque all studs to 50% and recheck.	3.0								60	2.5	;		checked with primavera
7.14	Remove SISSCO actuator from right MCHP.	0.0								0	2.5			checked with primavera
7.15	One hole at a time, remove the supernut. Using the eccentric gage slid onto the stud define the hole	2.0								Ť		1		
	eccentricity. Select bushing and machine to match required eccentricity. Install bushing. Replace nut and			1	1 1	l	1	1	1	1	i .	1		
	tighten back to 50% and recheck alignment. Total 10 days 7 days to pre fit & fab bushings (in parallel with													

WBS Nu	mber: 185										
VBS Titl	le: Assembly of Field Periods										
ob Num	nbers: 1802, 1810, and 1815										
ob Title	: FPA Oversight & Support (1802)										
	e: FPA Operations - Stations 1, 2, & 3 (1810)										
	: FPA Operations - Station 5 (1815)										
	ager: Mike Viola										
OD Man	agori mino viola										
	and Assembly				 	1	T				
ssumption	ns:										
	Assumes 5 day workweek 1 shift no overtime										
	Parallel ops for sta 5 (2 fixtures available)										
	Parallel ops for sta 5 (2 fixtures available)										
	Only 1 fixture for station 3 only										
	Parallel ops for sta 2										
7.16	Tighten nuts 100%. Measure before welding adequate coil alignment and fit-up of shims	1.0						20 2.5	5		checked with primaver
8.00	Weld all inboard shims							0 2.5	5		checked with primaver
8.01	Follow a predefined weld sequence at all MC's and partially weld the inboard shim. Perform weld peening operation. Perform a metrology measurement to re-verify coil alignment.	15.0					2	00 2.5			checked with primaver
8.02	Final complete MC scan to verify period alignment.	5.0					3	JU 2.0	100	Metrology Staff Budgeted as LO	
9.00	VVSA attachment to MC.	5.0						0 2.5		menology of an Daugetea as Lot	checked with primaver
9.01	Attach VV permanent vertical supports to the MC at the two outboard connection points at the top and			_				0 2.5	,		checked with primaver
	bottom of the Type-A MC.	2.0						10 2.5	5		checked with primaver
9.02	Attach temporary VV vertical supports to the MC at the two connection points at the top and bottom of the Type-B MC.	1.0						20 2.5	,		checked with primaver
9.03	Disconnect base support and transfer load to VV vertical supports.	1.0						20 2.5			checked with primaver
9.04	Install VV lateral supports and align VVSA to modular coils	4.0						30 2.5			checked with primaver
9.05	Prepare VVSA for transport. Install blocking as required to prevent any motion relative to the modular coils.	2.0						10 2.5			checked with primaver
10.00	Transfer Period to NCSX test cell.	2.0	1	1 1		+		0 2.5			checked with primaver
10.01	Install crane rigging to MCWF and transfer the unit to the transfer support frame. Secure Period /support	2.0						30 5.0			checked with primaver
10.02	frame to the transporter. Transfer completed Period to Station 5 located in NCSX test cell.	1.0	-					10 5.0			checked with primaver
	Subtotal FP#1	115		5			199		500		2495 checked with primaver
	Station 3-Assemble Mod Coils and VVSA-FP#2		i								checked with primaver
	Perform above sequence	115	\$ 5.0k	<			199	0 26	500.0		checked with primaver
	Station 3-Assemble Mod Coils and VVSA-FP#3	110	ψ 5.01	`			1	- 2.0	, 500.0	-	checked with primaver
		 115	¢ 50	,			199	0 0	500.0		
	Perform above sequence	115	\$ 5.0k	\			198	U 2.6	500.0		checked with primaver

WBS Num	nher: 185													
	: Assembly of Field Periods													
	pers: 1802, 1810, and 1815													
	FPA Oversight & Support (1802)													
Job Title:	FPA Operations - Stations 1, 2, & 3 (1810)													
Job Title:	FPA Operations - Station 5 (1815)													
	ger: Mike Viola													
JOD Walla	ger. Mike viola													
Fabrication a	and Assembly					l l								
Assumptions	3:													
	Assumes 5 day workweek 1 shift no overtime						,							
	•						1	Ī						
	Parallel ops for sta 5 (2 fixtures available)													
	Parallel ops for sta 5 (2 fixtures available)													
<u> </u>	Only 1 fixture for station 3 only													
	Parallel ops for sta 2													checked with primavera
														checked with phinavera
	TASK DESCRIPTION	Work days	41MS 37STK	STRVL 10T	ORNL EM/DSN	SH TB	EMEM	EMSM	EMSB	EMTB	SREW	et Crew	Basis of Estimate	ale and a single and a second
	TASK DESCRIPTION	uays	4 %	3.	ОШ	S	ш	ш	Ш	Ш	C	Σ	Shop based on similar tasks,	checked with primavera
													tempered (adjusted) for complexity of having to do all welds from inside of	
														checked with primavera
Job: 1815	- Field Period Assembly Station 5 (in NCSX TC)-VIOLA													checked with primavera
	Station 5- Final FP Assy -FP#1 (in NCSX TC)													checked with primavera
	metrology network	10.0	\$ 7.0K							160				checked with primavera
	Bolt on 2 Port Extensions needed for first Plasma diagnostics	1.0								16	2.0		10" ports provided by WBS 38	checked with primavera
	MTM NCR Hardware repurchase (bolt kits & cover plates)		\$ 42.0K											checked with primavera
	Weld Wire & weld supples		\$ 15.0K											checked with primavera
	Testout Sta 5 equipt & procedures	5.0								160				checked with primavera
	Check 3 sled interfaces adjust holes Fixtures installed - final metrology	12.0 6.0								384	4.0			checked with primavera checked with primavera
	Miscellaneous for tooling	6.0								192	4.0		\$ 1.027.8K	checked with primavera
	Station 5 preinstallation in parallel												ψ 1,027.5π	checked with primavera
1.00	Component preparations							1						checked with primavera
1.01	The short dome port (the one on the top of the dome) needs to cut off near the dome. The longest port													checked with primavera
	can remain.	2.0								40	2.5			checked with primavera
1.02	Install heat tape and theomocouples on all ports.												Covered in Station 2 LED: Reversed	
		0.0								0			order of 1.02 & 1.03	checked with primavera
1.03	Install insulation system around all ports.	0.0								0			Covered in Station 2	checked with primavera
<u> </u>	Install insulation system around all ports.	0.0		\square						0				checked with primavera
2.00	Install heat tape and theomocouples on all ports.	0.0								0	2.5			checked with primavera
2.00	Pre-Installation set-up Install period support fixture	2.0	-	+++						40	2.5			checked with primavera checked with primavera
2.02	motali period support intuite	2.0	1	\vdash						40	2.5			checked with primavera
	Install FPA on support stand. Use leveler pad to engage base of MC. Add bolts to secure in place.	2.0								40	2.5			checked with primavera
2.03	Install external working platforms	4.0					-			80				checked with primavera
2.04	Install internal VV working platforms	3.0								60	2.5			checked with primavera
3.00	VV port installation													checked with primavera
3.01	Install the domes (left and right side), inserting the long dome port through the MC opening, and weld the dome shell to the VV.	2.0								40	2.5			checked with primavera
3.02	Install small dome ports and remaining circular ports. Use a guide tool located at the MC hole opening to help support and center the port. Ports should already have insulation, heater tape and thermocouples on	30.0								600				checked with primavera
	them.									600				checked with primavera
3.03	them. Leak check each port immediately after it is welded.	30.0												
3.03 4.00	them. Leak check each port immediately after it is welded. Install port boot seal assembly	30.0	l				1			000	2.0			checked with primavera
										320	2.5			
4.00 4.01 5.00	Install port boot seal assembly Install boots on all ports except for the two port 4's. MC lead and coolant connections	30.0												checked with primavera
4.00 4.01	Install port boot seal assembly Install boots on all ports except for the two port 4's. MC lead and coolant connections Install MC lead connections on each of the MC's and temporally position the leads so they will not	30.0 16.0								320	2.5		in parallel with 5.02	checked with primavera checked with primavera checked with primavera
4.00 4.01 5.00 5.01	Install port boot seal assembly Install boots on all ports except for the two port 4's. MC lead and coolant connections Install MC lead connections on each of the MC's and temporally position the leads so they will not Interfere with the TF coil installation and for routing through the PF structure.	30.0									2.5		in parallel with 5.02	checked with primavera checked with primavera
4.00 4.01 5.00 5.01	Install port boot seal assembly Install boots on all ports except for the two port 4's. MC lead and coolant connections Install MC lead connections on each of the MC's and temporally position the leads so they will not	30.0 16.0								320	2.5		in parallel with 5.02	checked with primavera checked with primavera checked with primavera
4.00 4.01 5.00 5.01	Install port boot seal assembly Install boots on all ports except for the two port 4's. MC lead and coolant connections Install MC lead acconnections on each of the MC's and temporally position the leads so they will not interfere with the TF coil installation and for routing through the PF structure. Install MC coolant lines on each MC and position them for the TF installation and routing through PF	30.0 16.0 6.0								320 72	2.5 1.5 2.5		in parallel with 5.02	checked with primavera checked with primavera checked with primavera checked with primavera
4.00 4.01 5.00 5.01	Install port boot seal assembly Install boots on all ports except for the two port 4's. MC lead and coolant connections Install MC lead connections on each of the MC's and temporally position the leads so they will not interfere with the TF coil installation and for routing through the PF structure. Install MC coolant lines on each MC and position them for the TF installation and routing through PF structure. Platforms may need to be altered or moved for the installation of the TF coils. TF installation - right side	30.0 16.0 6.0 12.0								320 72 240	2.5 1.5 2.5		in parallel with 5.02	checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
4.00 4.01 5.00 5.01 5.02	Install port boot seal assembly Install boots on all ports except for the two port 4's. MC lead and coolant connections Install MC lead and coclant connections Install MC lead connections on each of the MC's and temporally position the leads so they will not satisfare with the TF ce ill installation and for routing through the PF structure Install MC coolant lines on each MC and position them for the TF installation and routing through PF structure. Platforms may need to be altered or moved for the installation of the TF coils.	30.0 16.0 6.0 12.0								320 72 240	2.5 1.5 2.5 2.5		in parallel with 5.02	checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera

WBS Nun	nber: 185				П									
	e: Assembly of Field Periods				+		1							
	bers: 1802, 1810, and 1815			\vdash	++							+		
	FPA Oversight & Support (1802)				\vdash									
					\vdash									
	FPA Operations - Stations 1, 2, & 3 (1810)				-									
	FPA Operations - Station 5 (1815)				-									
Job Mana	ger: Mike Viola													
Fabrication a	and Assembly				ш									
Assumption														
-	Assumes 5 day workweek 1 shift no overtime						1	l						
	Parallel ops for sta 5 (2 fixtures available)													
	Parallel ops for sta 5 (2 fixtures available) Only 1 fixture for station 3 only				-									
	Parallel ops for sta 2				\vdash									
6.02	Attach the temporary support at the end of the Type-C MC used to unload the a pair of center supports.													
6.02	Lawar lawalar and to discarge a bose of MC on the right side. Domove right side 1997	1.0			+		ļ			20	2.5	5		checked with primavera
6.03	Lower leveler pad to disengage base of MC on the right side. Remove right side leveler pad and intermediate support.	0.0	1 '	'						0	2.5	5		checked with primavera
6.04	Install TF support brackets (top & bottom) to the port 12 side on the Type-A MC (platforms will be	2.0								40	2.5			ah a ak a d with print
6.05	needed). Slide the first TF assembly against the TF support bracket and secure in place with the mating support	2.0	 	+-	++		-			40	2.5)		checked with primavera
	bracket.	1.0	L '							20	2.5			checked with primavera
6.06	Install TF support brackets (top & bottom) to the port 12 side on the Type-B MC.	2.0		$\Box\Box$	LI					40	2.5	5		checked with primavera
6.07	Slide the second TF assembly against the support bracket and secure in place with the mating support bracket.	1.0	1 '	'						20	2.5	5		checked with primavera
6.08	Install machine support plates (inboard and outboard) on the bottom, spanning two TF coil support				+									
	brackets.	3.0	 		₩					60	2.5			checked with primavera
6.09 6.10	Reinstall leveler pad to engage base of MC on the right side. Installed one side of the TF support brackets on the Type-C coil (top and bottom) for the TF installation to	0.0	 	+-	+					0	2.5)		checked with primavera
	occur at Station 6.	1.0	<u> </u>	<u> </u>					<u> </u>	20	2.5	5		checked with primavera
7.00	TF installation - left side													checked with primavera
7.01	The TF installation on the left side will follow the same ten (10) steps that were followed on the right side.	13.0	1							260	2.5	5		checked with primavera
8.00	TF fit-up check	10.0			_					200	2.0			checked with primavera
8.01	Perform a fit-up check of the four TF coils to determine if they can be positioned within tolerances.	5.0								100	2.5	5		checked with primavera
9.00	Install Ports 4													checked with primavera
9.01	Tack weld the left and right port 4's. Use a local laser attached to the port cover to define the port trajectory and to aid positioning in port during welding.	2.0	1							40	2.5	5		checked with primavera
9.02	Install boots on both port 4's.	4.0			_					80				checked with primavera
10.00	Installation of PF structural members and routing of MC coolant and leads.													checked with primavera
10.01	Install the PF coil support structure that surround the TF coils. In doing this the MC leads and coolant													
	lines need to be routed to the outside of the PF structure. PF structure is only partially installed at the Type-C MC's.	8.0	1							160	2.5	5		checked with primavera
11.00	MC header installation and coolant connections													checked with primavera
11.01	Install the MC coolant manifold outside of the PF structure in the area of PF6.	3.0								60	2.5	5		checked with primavera
11.02	Connect all MC coolant lines to the manifold (40 lines top and bottom)		1							400	٠.	_	Flex lines but need field supports	
12.00	Diagnostic	20.0	 	+-	+					400	2.5)	installed	checked with primavera checked with primavera
12.00	Install Rogowski coils on the end of the VV, left side. Route leads through space between port 8 and		 	\vdash	+		1					1		
	spool port opening and coil onto shell of MC for future routing	5.0	L							100	2.5	5		checked with primavera
13.00	Final measurements					 							Materia au Ctaff Budertado 105	checked with primavera
13.01	Obtain a set of Period 1 alignment fiducial positions to use in locating the VV within the MC.	5.0										100	Metrology Staff Budgeted as LOE Metrology Staff Budgeted as LOE	checked with primavera
13.02	Using the laser tracker, align to tooling balls on each MCHP, locking into a minimum of 8 of them. Using monuments on the VV for alignment, bring the VV into proper alignment. Make final adjust in the	1.0										20	Metrology Stall Budgeted as LOE	checked with primavera
	VV supports to secure VV in place.	4.0	1 '							80				checked with primavera
13.04	Install or identify three primary fiducials that will be used in positioning the Period in Station 6.	2.0								40	2.5	5		checked with primavera
13.05	Make a final measurement of all fiducials, the VV end flanges and the Type-C MC end flanges. Record the	5.0										100	Metrology Staff Budgeted as LOE	checked with primavera
13.10	Final Acceptance tests	3.0										1.00	man and a community of the community of	checked with primavera
13.11	Check Assembly (bolts, etc)	5.0			_					100	2.5	5		checked with primavera
13.12	Check Diagnostics (Loops, thermocouples)	5.0								100	2.5			checked with primavera
13.13	Check manifolds (pressure, flow, etc.)	5.0				-				100	2.5			checked with primavera
13.14	Check 6 modcoils (voltage etc)	6.0	L		\Box					120	2.5			checked with primavera
13.15 13.16	Check trim coils (voltage etc) Check TF coils (voltage etc)	3.0 6.0			+		ļ			60 120	2.5			checked with primavera
	Transfer Period to final assembly (Station 6).	6.0	 	+-	++		-			120	2.5)		checked with primavera
14 00			 		+-+		-			40	2.5	5		checked with primavera
14.00 14.01	Install crane rigging to completed Period assembly	シロ												
14.00 14.01 14.02	Install crane rigging to completed Period assembly Remove platforms	2.0	 		-					20				checked with primavera

		,		 						
WBS Number: 185										
WBS Title: Assembly of Field Periods										
Job Numbers: 1802, 1810, and 1815										
Job Title: FPA Oversight & Support (1802)										
Job Title: FPA Operations - Stations 1, 2, & 3 (1810)										
Job Title: FPA Operations - Station 5 (1815)										
Job Manager: Mike Viola										
Fabrication and Assembly		-	_	1	1	1	ı	 		
Assumptions:										
Assumes 5 day workweek 1 shift no overtime										
Parallel ops for sta 5 (2 fixtures available)										
Parallel ops for sta 5 (2 fixtures available)										
Only 1 fixture for station 3 only										
Parallel ops for sta 2										
Install on support platform (incl in job 7503)										checked with primavera
subtotal	196	1	0				4472	220 \$	4,692.0K	checked with primavera
Station 5- Final FP Assy -FP#2 (in NCSX TC)										checked with primavera
Repeat steps for FP #1	196	\$ -					4472	220		checked with primavera
Station 5- Final FP Assy -FP#3 (in NCSX TC)										checked with primavera
Repeat steps for FP #1	196	\$ -					4472	220		checked with primavera

WBS Number: 185

WBS Title: Assembly of Field Periods Job Numbers: 1802, 1810, and 1815

Job Title: FPA Oversight & Support (1802)

Job Title: FPA Operations - Stations 1, 2, & 3 (1810)

Job Title: FPA Operations - Station 5 (1815)

Job Manager: Mike Viola

Uncertainty of the Esti	mate				
Job 1802	<u>High</u>	<u>Medium</u>	Low	Uncertainty Range (%) -10%/+15%	Comments/Other Considerations
Design Maturity Design Complexity	X	x			LOE work based on recent NCSX experience LOE work based on recent NCSX experience, but complex processes
Job 1810 Station 1 Maturity Complexity	x	x		-10%/+15%	VV #1 actual experience - very near completion Requires field adjustments & tight metrology requirements which necessitates "back office" support
Station 2 Maturity Complexity	x		x	-30%/+60%	Still at conceptual design for all aspects of joint Challenging all aspects of engineering - W&-X experience also indicates FPA is the most challenging task
Station 3 Maturity Complexity	x		x	-30%/+60%	Still at conceptual design for all aspects of joint Challenging all aspects of engineering - W7-X experience also indicates FPA is the most challenging task
Job 1815 Design Maturity Design Complexity		X	x	-20%/+40%	Standard welding techniques adjust for welding in tight confines inside vessel Welding vessel while using metrology for measuring distortion

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

WBS Number: 185

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Job Title: FPA Operations - Station 5 (1815)

Job Manager: Mike Viola

		Likelihood of			Cost In	npact	Schedule Im	pact
Job	Risk Description	Occurring	Mitigation Plan	Basis of estimate	Low	High	Low	High
pers	s or prolonged unavailability of certain key onnel (Viola or Perry) from the project could stantially impact the schedule.	VU	Viola and Perry will be cross- trained such that each could od the other's job	Estimated impact is <1 months on the critical path. Cost estimates cover 0-1 months of near term FPA assembly (in addition to the standing army costs addressed under schedule impact).	+ \$0	+ \$150	+ 0.00	+ 0.50
beco	ck office" support for FPA and final assembly omes a chronic bottleneck, stretching out the required to complete assembly operations	VU	Additional support budgeted for Brown, Brooks, and Ellis providing "2 deep" back office support. Should be available to mitigate peak demands once training in key skills is completed.	of FPA/final assembly.	+ \$0	+ \$600	+ 0.00	+ 2.00
	ular coil damaged during assembly requiring ificant rework to coil	VU	Equipment will be handled during FPA using carefully constructed procedures to minimize likelihood of damage.	Nominally repaired with a 2- man crew within 2 weeks	+ \$10	+ \$20	+ 0.00	+ 0.50
	surface component (coolant tube, flux loop, or damaged during FPA requiring significant ork	VU	Equipment will be handled during FPA using carefully constructed procedures to minimize likelihood of damage.	Nominally repaired with a 2- man crew within 2 weeks	+ \$10	+ \$20	+ 0.00	+ 0.50

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Job Manager: Mike Viola

Unacceptable distortion in a field period when welding modular coil shims requiring	VU	Likelihood of occurrence is very unlikely as a result of extensive welding R&D and careful monitoring during welding.	Cut apart and re-weld two coils back together. Nominally a 2.5-man crew in 12 weeks.	+ \$25	+ \$35	+ 0.75	+ 1.25
Field period damaged during loading, transport, or unloading from TFTR TC to NCSX TC	NC	Extreme care will be taken when transporting a field period renering this event extremely unlikely.	Crisis event not covered by contingency				
Metrology equipment and general purpose tooling/ lifting equipment (e.g.cranes) not available to support the schedule	U	Maintenance contract mitigates impact of metrology equipment. Additional \$200K budgeted for a 3rd laser tracker and/or spare metrology equipment. Should result in improved efficiency.	and critical path. FPA cost impact assumed to be \$300k/mo.	+ \$0	+ \$150	+ 0.00	+ 0.50
1815 Metrology equipment and general purpose tooling/ lifting equipment (e.g.cranes) not available to support the schedule	U	Maintenance contract mitigates impact of metrology equipment. Additional \$200K budgeted for a 3rd laser tracker and/or spare metrology equipment. Should result in improved efficiency.	and critical path. FPA cost impact assumed to be \$300k/mo.	+ \$0	+ \$150	+ 0.00	+ 0.50

WBS Number: 185

WBS Title: Assembly of Field Periods Job Numbers: 1802, 1810, and 1815

Job Title: FPA Oversight & Support (1802)

Job Title: FPA Operations - Stations 1, 2, & 3 (1810)

Job Title: FPA Operations - Station 5 (1815)

Job Manager: Mike Viola

		nwobamua

NC

Welds will be leak checked Impacts of having a few leaks during FPA when leaks can be is covered in estimate addressed without significantly uncertainty with present impacting the critical path.

Likelihood of many leaks appearing during initial pumpdown is considered extremely unlikely with this

mitigation plan.

Notes:

- [1] Low cost and schedule impacts are considered the minimum (0-percentile) impacts should the event occur.

 High cost and schedule impacts are considered the maximum (100-percentile) impacts should the event occur
- [2] Cost impacts should be entered as man-hours (by demographic) and M&S direct cost under basis of estimate. Cost impacts should NOT include standing army costs which are separately calculated from the schedule impact Project control is reponsible for quantifying the low and high cost impacts based on the labor hours and M&S identified
- [3] The schedule impacts should be entered as the min and max impacts on the critical path. If there is no critical path impact then the schedule entries should be zero.
- [4] Likelihood of occurrence should be entered consistent with our risk classification methodology, i.e. VL= Very Likely (P>80%), L=Likely (80%>P>40%), U=Unlikley (40%>P>10%), VU=Very Unlikely (P<10%), NC=Non-credible (P<1%)

WBS Number: 185

WBS Title: Assembly of Field Periods Job Numbers: 1802, 1810, and 1815

Job Title: FPA Oversight & Support (1802)

Job Title: FPA Operations - Stations 1, 2, & 3 (1810)

Job Title: FPA Operations - Station 5 (1815)

Job Manager: Mike Viola

EWI Budgetary Proposal No. 50782GTH Date: June 5, 2007

Submitted to: Princeton Plasma Physics Lab

Title: On-Site Design Review and Sample Evaluation

Objectives: Discuss design for welding with minimal distortion meeting minimum fatigue requirements Perform evaluation of welds on test specimen.

Approach:

- Design review with Bill Mohr from EWI in Princeton, New Jersey, followed up with a written report. Dr. Mohr has extensive experience in fitness-for-service assessment, design, and fatigue of welded structures. This will be an opportunity to validate your considerations regarding distortion, allowable stresses, and other design concerns.
- 2. A sample weld to be evaluated at EWI using ultrasonic and radiographic testing. Macros will be
- generated and evaluated and a report will be sent.

 Recommendation for additional work will be made after the design review and test weld

Deliverables

A report will be written summarizing the results of the design review. Lab results, macros and a summary of explanation will be delivered with recommendations.

Program Budget and Duration:

The above work can be completed with a price of \$18,075. The work is planned for a period of 20 days after receipt of purchase order and any required materials. This quotation is firm fixed price for the work scope outlined in the proposal and, once accepted, will not be changed without the concurrence of both parties. It is understood that if the Client requests an expanded work scope, EWI will quote the cost and timing to complete the additional work.



Notes
1 - Labor rates are fully burdened
2 - EWI indirect rates are ACO approved provisional rates

Edison Welding Institute Support of Test Welding Program

ORNL Updated Title III Engineering (6/8/2007)

Station tation 2	No. start date Oct-07	end date Mar-09	days 517.00	weeks	2954	st peric2	nd peri 3t 394	nd period	1182	ENGR I	Designe To 591	otal hrs 1182		
ation 3	Feb-08	Jul-09	516.00	74	2949	491	295	98	885	442	442	885	_	
ation 5	Apr-08	Sep-09	518.00	74	2960	493	296	99	888	444	444	888	Station 2 to 5 (FPA -	otal Ho
ation 6	Jun-09	Oct-10	487.00	70	2783	742	557	371	1670	1670	835	2505	Station 6 (Fnl Mach A	25
	Assume each period is 1/	/3 of the number of week	701 KS	100	4006 1s 2r 3t	tation 2 st period and period thd period	60% 60° 40% 40° 20% 20°	werage % Engr/Dsn % Engr/Dsn % Engr/Dsn		Ti Job 1802 J \$4,500 \$9,000 \$4,500	FY	/2007 /2008 /2009 /2010		
						NGR esigner	50% Ave							
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						0	30% 309	% Engr/Dsn						
						0	10% 109	% Engr/Dsn						
						NGR esigner	50% Ave							
					Si	tation 5		verage % Engr/Dsn						
						0		% Engr/Dsn						
						0	10% 109	% Engr/Dsn						
						NGR esigner	50% Ave							
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Activity	MILE-	Activity	Duration	Baseline	Baseline	Shifts	Total	%	Proposed												
ID	stones (level 2	Description	(work days	Start	Finish		Float	cmplt	Budgeted	FY07		FY08		FY09		FY1	0	FY	′11		FY12
	& 3)		,-							Ш			ШШ				Ш	ШШ		Ш	Ш
		Oversight&Support-VIOLA																			
Oversight and	l Supervi	ision																			
1802MAY		May cost incr	20	01MAY07*	29MAY07		1,335	LOE	15,000.00												
1802ORNL02		ORNL Title III field period assy station 2	326*	24OCT07	19FEB09		4	LOE	152,828.16			0.1		ORNL travel	_EM =: =6	591;o	rnldm=	: 591			
1802ORNL03		ORNL Title III field period assy station 3	318*	03MAR08	08JUN09		0	LOE	117,143.02					c			42;orn	ldm=44	12		
1802ORNL05		ORNL Title III field period assy station 5	260*	30OCT08	13NOV09		0	LOE	122,171.24					,	c			44;ornlo	dm=44	4	
R1802-001		Metrology Engr Super FY07	106*	01MAY07*	28SEP07		1,249	LOE	62,722.80		IEA//I	EM =36	30hr ;			۵۰۰.					
R1802-003		Metrology Engr Super FY08	250*	01OCT07*	30SEP08		999	LOE	160,310.88				EA/	/EM =86	33hr ;						
R1802-004		Metrology Engr Super FY09	281*	01OCT08*	13NOV09		718	LOE	194,695.10						E	A//EN	Л =863	shr;			
R1802-004S		Metrology Engr Super FY09 (2n shft suprt .5 fte	203*	30JAN09*	13NOV09	2	718	LOE	134,631.52						E	A//EN	Λ =.5 f	te			
R1802-005		FPA Management FY07	106*	01MAY07*	28SEP07		1,249	LOE	115,712.78		IEM//	EM =1	.0 fte; 4	1=06\$k	;						
R1802-007		FPA Management FY08	250*	01OCT07*	30SEP08		999	LOE	277,523.54			1.	<u>ш</u> ем	//EM =1.	.0 fte						
R1802-008		FPA Management FY09	281*	01OCT08*	13NOV09		718	LOE	322,131.05						E	M//EI	M =1.0	fte			
R1802-013		HP Coverage in the TFTR TC LOE FY07	106*	01MAY07*	28SEP07		1,249	LOE	59,214.54		Ish//	ГВ =.75	5 fte								
R1802-015		HP Coverage in the TFTR TC LOE FY08	250*	01OCT07*	30SEP08		999	LOE	149,857.40			1.1	≣ SH/	/TB =.75	5 fte						
R1802-016		HP Coverage in the TFTR TC LOE FY09	169*	01OCT08*	08JUN09		830	LOE	104,271.28							=(.75	fte);				
R1810-098		Station 3 complete	0		08JUN09		830		0.00						7						
Station 2 proc	edures,	JHA,ACC,Training,Prep																			
R1802-207		Procedures written & approved	14	12SEP07	01OCT07		0		0.00		Viola										
R1802-209		JHA completed	6	02OCT07	09OCT07		0		0.00		Viola										
R1802-211		Training needs identified & released	6	10OCT07	17OCT07		0		0.00		Viol										
R1802-213		ACC review completed	2	18OCT07	19OCT07		0		0.00		Viol										
R1802-215		Pre-job brief completed	1	22OCT07	22OCT07		0		0.00		Viol										
R1802-217		Station 2 operational	1	23OCT07	23OCT07		0		0.00		lVio	а									
Station 3 proc	edures,	JHA,ACC,Training,Prep																			
_				T			_														
R1802-307		Procedures written & approved	10	15JAN08	28JAN08		56		0.00			Viola									
R1802-309		JHA completed	6	29JAN08	05FEB08		56		0.00			Viola •									
R1802-311		Training needs identified & released	6	06FEB08	13FEB08		56		0.00			Viola									
R1802-313		ACC review completed	6	14FEB08	21FEB08		56		0.00			Viola									
R1802-315	1	Pre-job brief completed JHA,ACC,Training,Prep	6	22FEB08	29FEB08		56		0.00			Viola									
Station 5 proc	euures,	ла,дос, пашшу,гтер																			
R1802-507		Procedures written & approved	14	16APR08	05MAY08		97		0.00			■Vio	ola								
R1802-509		JHA completed	6	06MAY08	13MAY08		97		0.00			I∨i	ola								
R1802-519		Fixtures installed	6	14MAY08	21MAY08		97		0.00			Į√i	ola								
R1802-511		Training needs identified & released	6	22MAY08	30MAY08		97		0.00			V	iola								
R1802-513		ACC review completed	7	02JUN08	10JUN08		97		0.00			I۷	/iola								
un Date	18JI	UL07 07:31	ETCZ		CSX Project		Sheet 3	3 of 99													
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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
R1802-515		Pre-job brief completed	7	11JUN08	19JUN08		97		0.00		Viol	a			
Subtotal			637	01MAY07	13NOV09		718		1,988,213.31			$\overline{\nabla}$			

R1801-004S I R1810-001 I R1810-003 I R1810-005 I R1810-007 I R1810-008 I R1810-009 I R1810-011 I R1810-012 I R1810-013 I R1810-015 I R1810-015 I R1810-015 I R1810-015 I R1810-016 I R1810-099 Station 1-VV Prep (hard	Description Od Assy -Station 1,2,3 VIOLA t LOE Crane support, fixt setup (2nd shft 1.2 fte LOE Crane support, fixture setupfor FY07 LOE Crane support, fixture setupfor FY08 LOE Crane support, fixture setupfor FY09 LOE Field Supervision for FY07 LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08 Misc M&S FY09	203* 106* 250* 281* 106* 250* 281* 203* 106* 250* 281* 106* 250* 281*	30JAN09* 01MAY07* 01OCT08* 01MAY07* 01OCT08* 30JAN09* 01MAY07* 01OCT07* 01OCT07*	13NOV09 28SEP07 30SEP08 13NOV09 28SEP07 30SEP08 13NOV09 13NOV09 28SEP07 30SEP08	V09												
R 3 Job:1810-Field Perio General Assy Support R1801-004S R1810-001 R1810-003 R1810-005 R1810-007 R1810-008 R1810-009 R1810-011 R1810-012 R1810-013 R1810-015 R1810-015 R1810-016 R1810-099 Station 1-VV Prep (harce R1810-1105 R1810-1105 R1810-1105 R1810-1105 R1810-019 Station 1-VV Prep (harce R1810-1105 R1810-	LOE Crane support, fixt setup (2nd shft 1.2 fte LOE Crane support, fixture setupfor FY07 LOE Crane support, fixture setupfor FY08 LOE Crane support, fixture setupfor FY09 LOE Field Supervision for FY07 LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	203* 106* 250* 281* 106* 250* 281* 203* 106* 250* 281* 106*	01MAY07* 01OCT07* 01OCT08* 01MAY07* 01OCT07* 01OCT08* 30JAN09* 01MAY07* 01OCT07* 01OCT08*	28SEP07 30SEP08 13NOV09 28SEP07 30SEP08 13NOV09 13NOV09 28SEP07 30SEP08		1,249 999 718 1,249 999 718 718 1,249	LOE LOE LOE LOE LOE LOE	64,854.45 165,923.83 192,599.92 96,036.83 245,765.14 285,266.98 206,388.38		EE//S	M =71	3hr; 1.2 fte 1.2 fte 3hr; 1.0 fte		1.2 ft	e e		
R1801-004S I R1810-001 I R1810-003 I R1810-005 I R1810-007 I R1810-008 I R1810-009 I R1810-011 I R1810-012 I R1810-013 I R1810-015 I R1810-015 I R1810-015 I R1810-015 I R1810-016 I R1810-099 Station 1-VV Prep (hard	LOE Crane support, fixt setup (2nd shft 1.2 fte LOE Crane support, fixture setupfor FY07 LOE Crane support, fixture setupfor FY08 LOE Crane support, fixture setupfor FY09 LOE Field Supervision for FY07 LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	106* 250* 281* 106* 250* 281* 203* 106* 250* 281* 106*	01MAY07* 01OCT07* 01OCT08* 01MAY07* 01OCT07* 01OCT08* 30JAN09* 01MAY07* 01OCT07* 01OCT08*	28SEP07 30SEP08 13NOV09 28SEP07 30SEP08 13NOV09 13NOV09 28SEP07 30SEP08		1,249 999 718 1,249 999 718 718 1,249	LOE LOE LOE LOE LOE LOE	64,854.45 165,923.83 192,599.92 96,036.83 245,765.14 285,266.98 206,388.38		EE//S	M =71	3hr; 1.2 fte 1.2 fte 3hr; 1.0 fte		1.2 ft	e e		
R1801-004S I R1810-001 I R1810-003 I R1810-004 I R1810-005 I R1810-007 I R1810-008 I R1810-009 I R1810-011 I R1810-012 I R1810-013 I R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard	LOE Crane support, fixt setup (2nd shft 1.2 fte LOE Crane support, fixture setupfor FY07 LOE Crane support, fixture setupfor FY08 LOE Crane support, fixture setupfor FY09 LOE Field Supervision for FY07 LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	106* 250* 281* 106* 250* 281* 203* 106* 250* 281* 106*	01MAY07* 01OCT07* 01OCT08* 01MAY07* 01OCT07* 01OCT08* 30JAN09* 01MAY07* 01OCT07* 01OCT08*	28SEP07 30SEP08 13NOV09 28SEP07 30SEP08 13NOV09 13NOV09 28SEP07 30SEP08		1,249 999 718 1,249 999 718 718 1,249	LOE LOE LOE LOE LOE LOE	64,854.45 165,923.83 192,599.92 96,036.83 245,765.14 285,266.98 206,388.38		EE//S	M =71	3hr; 1.2 fte 1.2 fte 3hr; 1.0 fte		1.2 ft	e e		
R1810-001	LOE Crane support, fixture setupfor FY07 LOE Crane support, fixture setupfor FY08 LOE Crane support, fixture setupfor FY09 LOE Field Supervision for FY07 LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	106* 250* 281* 106* 250* 281* 203* 106* 250* 281* 106*	01MAY07* 01OCT07* 01OCT08* 01MAY07* 01OCT07* 01OCT08* 30JAN09* 01MAY07* 01OCT07* 01OCT08*	28SEP07 30SEP08 13NOV09 28SEP07 30SEP08 13NOV09 13NOV09 28SEP07 30SEP08		1,249 999 718 1,249 999 718 718 1,249	LOE LOE LOE LOE LOE LOE	64,854.45 165,923.83 192,599.92 96,036.83 245,765.14 285,266.98 206,388.38		EE//S	M =71	3hr; 1.2 fte 1.2 fte 3hr; 1.0 fte		1.2 ft	e e		
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R1810-004 I R1810-005 I R1810-007 I R1810-008 I R1810-008 I R1810-009 I R1810-011 I R1810-012 I R1810-015 I R1810-016 I R1810-099 I R1810-016 I R1810-099 I R1810-1105 I R1810	LOE Crane support, fixture setupfor FY09 LOE Field Supervision for FY07 LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	281* 106* 250* 281* 203* 106* 250* 281* 106*	010CT08* 01MAY07* 010CT07* 010CT08* 30JAN09* 01MAY07* 010CT07* 010CT08*	13NOV09 28SEP07 30SEP08 13NOV09 13NOV09 28SEP07 30SEP08	2	718 1,249 999 718 718 1,249	LOE LOE LOE LOE	192,599.92 96,036.83 245,765.14 285,266.98 206,388.38		EE//S	M =71	9hr ;		1.0 ft	e		
R1810-005 I R1810-007 I R1810-008 I R1810-008S I R1810-009 I R1810-011 I R1810-012 I R1810-013 I R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard	LOE Field Supervision for FY07 LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	106* 250* 281* 203* 106* 250* 281* 106*	01MAY07* 01OCT07* 01OCT08* 30JAN09* 01MAY07* 01OCT07* 01OCT08*	28SEP07 30SEP08 13NOV09 13NOV09 28SEP07 30SEP08	2	1,249 999 718 718 1,249	LOE LOE LOE	96,036.83 245,765.14 285,266.98 206,388.38				9hr ; ⊒ 1.0 fte		1.0 ft	e		
R1810-007	LOE Field Supervision for FY08 LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	250* 281* 203* 106* 250* 281* 106*	010CT07* 010CT08* 30JAN09* 01MAY07* 010CT07*	30SEP08 13NOV09 13NOV09 28SEP07 30SEP08	2	999 718 718 1,249	LOE LOE	245,765.14 285,266.98 206,388.38				1.0 fte					
R1810-008 I R1810-008S I R1810-009 I R1810-011 I R1810-012 I R1810-013 I R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard	LOE Field Supervision for FY09 LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	281* 203* 106* 250* 281* 106*	01OCT08* 30JAN09* 01MAY07* 01OCT07*	13NOV09 13NOV09 28SEP07 30SEP08	2	718 718 1,249	LOE	285,266.98 206,388.38			1						
R1810-008S I R1810-009 I R1810-011 I R1810-012 I R1810-013 I R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard	LOE Field Supervision for 2nd shft 1.0 fte LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	203* 106* 250* 281* 106*	30JAN09* 01MAY07* 01OCT07* 01OCT08*	13NOV09 28SEP07 30SEP08	2	718 1,249	LOE	206,388.38	::::								
R1810-009 I R1810-011 I R1810-012 I R1810-013 I R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard	LOE Metrology sprt FY07 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	106* 250* 281* 106*	01MAY07* 01OCT07* 01OCT08*	28SEP07 30SEP08	2	1,249		·						//s			
R1810-011	LOE Metrology sprt FY08 1.5 fte EM & 1.0 fte TB LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	250* 281* 106*	01OCT07* 01OCT08*	30SEP08			LOE	197,832.33	::::	1					SM =1.0	fte	
R1810-012 I R1810-013 I R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard	LOE Metrology sprt FY09 1.5 fte EM & 1.0 fte TB Misc M&S FY07 Misc M&S FY08	281* 106*	01OCT08*			200				IEM//E	M =99	7hr ; EM	//TB =63	31hr ;			
R1810-013 I R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard	Misc M&S FY07 Misc M&S FY08	106*		13NOV09		999	LOE	771,108.00				Ем//Е	M = 360	00 hr; E	M//TB	= 2400 h	r;
R1810-015 I R1810-016 I R1810-099 S Station 1-VV Prep (hard R1810-1105 I	Misc M&S FY08		04848707*	10110 103		718	LOE	433,249.15						≡ЕМ//	EM =19	960 hr;E	.M//TB = 1
R1810-016 I R1810-099 Station 1-VV Prep (hard		250*	UTIVIATU	28SEP07		1,249	LOE	19,140.00	::::	41=1	5\$k ;						
R1810-099 Station 1-VV Prep (hard	Misc M&S FY09		01OCT07*	30SEP08		999	LOE	47,088.00				1 41=36	\$k ;				
Station 1-VV Prep (hard		281*	01OCT08*	13NOV09		718	LOE	57,664.57					- ; ; ;	41=4	1.16		
R1810-1105	Station 5 complete	0		13NOV09		718		0.00					•				
	rd surface components) FP#1																
	lactionaling lines 9 Wold cooling/htm sizes	24	01MAY07*	42 11 1107		240		40.445.00									
R1810-1107	Instl cooling lines & Weld cooling/htg risers	31		13JUN07								41=02\$k	ς;				
D4040 4400	Verify InstI of H/C lines,headers,manifolds	5	14JUN07	20JUN07													
	Perform final acceptance testing (H/C flow test)	5	20JUL07	26JUL07				,				ſ					
	Purchase pump	20	21JUN07*	19JUL07 18SEP07													
	Loop termination & verification	18	23AUG07	1 1		-		•									
	Trim seal plates	2	01OCT07*	02OCT07		-											
	Install Final Internal&Ext monuments & meas Final Scan	4	09JAN08	14JAN08				,									
		4	15JAN08	18JAN08				,									
	Install heater tape on all removable ports	20	21JAN08	15FEB08				,					;				
R1810-1113 I Station 1- VV Prep (hrd	Prepare &transfer completed VV to holding area	2	18FEB08	19FEB08	1	116		3,204.40			EM//I	B =40hr ;					
Station 1- VV Frep (nrd	a sun cripiliser#2																
R1810-1203	Misc Hardware	170	01JUN07*	08FEB08		1,163	LOE	2,584.38		0.0	41=02	šk;					
R1810-1209 I	Install cooling/htg lines to vac vsl	15	01MAY07	21MAY07	1	237		22,545.00] ЕМ//	TB =3	00hr ;						
R1810-1211	Weld cooling/htg risers	16	22MAY07	13JUN07	1	237		26,600.00	В ЕМ∕	/TB =	320hr ;	41=02\$k	ς;				
R1810-1213	Verify Instl of H/C lines,headers,manifolds	5	14JUN07	20JUN07	1	390		7,515.00	ІЕМ	/TB =	100hr						
R1810-1208	Perform final acceptance testing (H/C flow test)	5	21JUN07	27JUN07	1	390		12,619.00	ІЕМ	//TB =	100hr	; 41=04\$I	k ;				
R1810-1212	Trim seal plates	2	26OCT07*	29OCT07	1	258		3,204.40		IEM/	/TB =4	Ohr ;					
R1810-1215	Loop termination & verification	18	26NOV07	21DEC07	1	239		28,839.60		DE	и//TB =	-360hr ;					
R1810-1216	Install Final Internal&Ext monuments & meas	4	02JAN08	07JAN08	1	239		6,408.80		IĘ	м//тв	=80hr ;					
un Date 18JU	UL07 07:31	ETCZ	No	CSX Project	1	Sheet 3	5 of 99										
© Primavera System	0L07 07:31			e Loaded Scho													

Activity	MILE- Activity	Duration	Baseline	Baseline	Shifts	Total	%	Proposed										
ID	stones Description (level 2	(work days	Start	Finish		Float	cmplt	Budgeted	FY07	F	Y08		FY09	1	FY10	FY11		FY1:
	8.3)	-								Щ				ШШ	ШШ	ШШ	Ш	
R1810-1217	Final Scan	4	08JAN08	11JAN08	1	239		6,408.80			M//TB							
R1810-1214	Install heater tape on all removable ports	20	14JAN08	08FEB08	1	239		16,022.00			EM//TE							
R1810-1219	Prepare& transfer completed VV to holding area	2	11FEB08	12FEB08	1	239		3,204.40		I	EM//TE	3 =40hi	;		ш		Щ	
Station 1- VV	Prep (hrd surf cmpntsFP#3																	
R1810-1303	Misc Hardware	139	15MAY07*	28NOV07		1,206	LOE	2,571.80		Ш ЕМ	I//TB =0	00hr ; 4	1=02\$k					
R1810-1304	Layout diag &coolant paths on vessel	12	01MAY07	16MAY07	1	450		18,036.00]EM//T	ΓB =2	40hr ;							
R1810-1305	Install heater tape on vertical ports	7	17MAY07	25MAY07	1	450		10,521.00	I EM//	TB =1	40hr ;							
R1810-1307	Verify installation of heater tapes	1	02JUL07*	02JUL07	1	442		1,503.00	lем	//TB =	=20hr ;							
R1810-1309	Attach studs forcoolant lines	3	03JUL07	06JUL07	1	442		4,509.00	EМ	//TB =	=60hr ;							
R1810-1300	Install Templates	3	25JUN07*	27JUN07	1	227		4,509.00	lem/	//TB =	60hr ;							
R1810-1311	Wind magnetic diagnostic sensors	14	11JUL07*	30JUL07	1	219		21,042.00	0en	///TB	=280hr	.;						
R1810-1313	Install precision magnetic diagnostic sensors	3	31JUL07	02AUG07	1	219		4,509.00	len	и//тв	=60hr	;						
R1810-1315	Verify installation magnetic diagnostic sensors	4	03AUG07	08AUG07	1	219		6,012.00	len	и//тв	=80hr	;						
R1810-1317	Install local I&C (incl thermocouples)	5	09AUG07	15AUG07	1	356		7,515.00	ler	M//TB	=100h	ır ;						
R1810-1319	Verify installation of local I&C	2	16AUG07	17AUG07	1	356		3,006.00	lei	м//тв	8 =40hr	;						
R1810-1321	Install cooling/htg lines to vac vsl	10	20AUG07	31AUG07	1	356		22,545.00	l e	M//TE	3 =3001	nr;						
R1810-1323	Weld cooling/htg risers	10	04SEP07	17SEP07	1	356		24,048.00	0 6	EM//T	B =320	hr;						
R1810-1325	Verify InstI of H/C lines,headers,manifolds	5	18SEP07	24SEP07	1	356		7,515.00	b	EM//T	B =100)hr ;						
R1810-1308	Perform final acceptance testing (H/C flow test)	5	25SEP07	01OCT07	1	356		7,614.20	1	ЕМ//1	ΓB =10	Ohr ;						
R1810-1312	Trim seal plates	2	30OCT07	31OCT07	1	360		3,204.40		IEM/	/TB =4	Ohr ;						
R1810-1327	Loop termination & verification	18	02JAN08	25JAN08	1	299		28,839.60		■ E	EM//TB	=360h	r;					
R1810-1328	Install Final Internal&Ext monuments & meas	4	28JAN08	31JAN08	1	299		6,408.80		le	EM//TB	=80hr	;					
R1810-1329	3 Final Scan	4	01FEB08	06FEB08	1	299		6,408.80		l	EM//TE	8 =80hr	;					
R1810-1314	Install heater tape on all removable ports	20	15FEB08*	13MAR08	1	273		16,022.00			ВЕМ//Т	B =200	hr ;					
R1810-1331	Prepare & transfer completed VV to holding area	2	14MAR08	17MAR08	1	273		3,204.40			Іем//т	B =40l	nr;					
Station 1-Spo	ol pieces (3) (spacers)																	
R1810-1S03	Attachdiagnostics, studs and coolant lines	17	03NOV08*	25NOV08	1	288		28,036.40					√//TB =:	2405-				
R1810-1303	Install Final Internal&Ext monuments & meas	2	26NOV08	01DEC08	1	288		3,298.40										
	Is & Development		20140700	UIDECOS	'	200		3,296.40				i E	M//TB =	40nr ;				
1	VB flange weld test																	
INTRF-035	PPPL Determine shim material	23	01MAY07	01JUN07		59		6,969.20	ea//e	m=40)							
INTRF-001	PPPL buy SS plate for weld trials	10	04JUN07	15JUN07		1,322		40,762.56	[м&ѕ	S=31 e	em//em	n=8						
PHIL-02	weld shim DXF files complete	1	28JUN07*	28JUN07		18		0.00	I									
PHIL-03	complete CAD model of weld test specimen	1	06JUL07*	06JUL07		13		0.00										
PHIL-04	water jet cut shims for A/B flange weld test	3	09JUL07	11JUL07		13		1,803.60	І ЕМ	//TB	=24hr	;						
PHIL-05	solution anneal shims (note: shims not ground).	1	12JUL07	12JUL07		16		991.36	ІЕМ	I//SM	=08hi	- ;						
PHIL-06	assemble shims&flangesgrind relief in flanges	3	13JUL07	17JUL07		16		3,607.20	ІЕМ	1//TB	=48hr							
PHIL-07	weld & monitor distortion; improvise clamping	3	18JUL07	20JUL07		16		3,607.20	lev	//TB	=48hr	;						
Run Date	18JUL07 07:31	ETCZ	NO	CSX Project		Sheet 3	6 of 99									 		
				e Loaded Sch	edule													
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Activity	MILE-	Activity	Duration	Baseline	Baseline	Shifts	Total	%	Proposed												
ID	stones (level 2	Description	(work days	Start	Finish		Float	cmplt	Budgeted	FY07	7 1	Y08		FY09)	FY	10	FY1	1	FY	/12
	& 3)		uayo																		
PHIL-08		analyze results at PPPL	2	23JUL07	24JUL07		16		0.00	- 1											
PHIL-09		analyze welds at EWI	10	25JUL07	07AUG07		16		0.00	0											
Casting Weld T	Tests																				
PHIL-11		Mount A6 on angle plate	1	25JUN07*	25JUN07		22		1,202.40	lEN	и//ТВ	=16hr	;								
PHIL-12		Weld fiducials on A6 & B6	2	10JUL07*	11JUL07		13		2,404.80	ΙE	M//TB	=32hı	;								
PHIL-13		Measure A6 casting	2	12JUL07	13JUL07		13		0.00	I											
PHIL-14		Develop metrology plan for station 2	65*	01JUN07	31AUG07		6		0.00												
PHIL-15		Remove A6 & lower & grout wedge	4	16JUL07	19JUL07		13		4,809.60	ΙE	M//TB	=64h	٠,								
PHIL-16		Re-mount A6 on wedge	2	20JUL07	23JUL07		13		2,404.80	le	M//TB	=32h	r;								
PHIL-17		Re-measure A6	2	24JUL07	25JUL07		13		0.00	- 1											
PHIL-18		Measure B6 on wedge	2	26JUL07	27JUL07		13		2,404.80	le	M//TB	=32h	r ;								
PHIL-19		Place B6 on A6; Meas B6 casting use A6 as base	2	30JUL07	31JUL07		15		0.00	1											
PHIL-20		Complete CAD model for dimensional ref.	3	01AUG07	03AUG07		15		0.00												
PHIL-21		Prepare angle plate dogs & chocks	4	10JUL07*	13JUL07		71		4,809.60	ΙE	M//TB	=64hı	;								
PHIL-22		Water jet cut outboard 0,5" stk 316 SS shims	4	12JUL07	17JUL07		13		2,404.80	ΙE	м//тв	=32hi	٠;								
PHIL-23		Water jet cut inboard 0.625 316 SS	3	18JUL07	20JUL07		13		1,803.60	ΙE	M//TB	=24h	r;								
PHIL-24		Assemble castings,align torque&meas inbd. shims	4	23JUL07	26JUL07		13		4,809.60	le	М//ТВ	=64h	r;								
PHIL-25		Purchase (2) grinding machines	45	13JUL07*	14SEP07		23		51,040.00		1 41=40)\$k ;									
PHIL-26		Grind inbd. Shims to thickness (outside shop)	4	27JUL07	01AUG07		13		1,276.00	[4	11=01\$	k ;									
PHIL-27		Solution anneal shims	2	02AUG07	03AUG07		13		1,982.72	E	EM//SN	1 =16	nr;								
PHIL-28		bushing drawings complete	0	02JUL07*	29JUN07		54		0.00	1											
PHIL-29		fabricate stock bushings	5	09JUL07*	13JUL07		55		0.00	ı											
PHIL-30		Zenex - fabricate eccentric bushings	5	09JUL07*	13JUL07		50		1,658.80	I 4	1=01\$k	;									
PHIL-31		Receive hardware - studs, washers	0	20JUL07*	19JUL07		19		0.00	1											
PHIL-32		Align castings	2	30JUL07	31JUL07		13		2,404.80	(E	EM//TB	=32h	r;								
PHIL-33		Fit&install bushings 25% stock, 25% eccentric	5	01AUG07	07AUG07		38		6,012.00	le	ЕМ//ТВ	=80h	ır ;								
PHIL-34		Weld procedure/weld qual.	7	09JUL07*	17JUL07		31		4,208.40	lε	м//тв	=56hi	٠,								
PHIL-35		Purchase weld on strain gauges	14	09JUL07*	26JUL07		16		0.00	0											
PHIL-36		Install strain gauges	5	27JUL07	02AUG07		16		4,956.80	le	EM//SN	1 =40	nr ;								
PHIL-37		Set up dial ind., CMM, transit system	5	01AUG07	07AUG07		13		3,006.00	le	EM//TB	=40h	ır ;								
PHIL-38		Install all shims and adjust bushings	2	06AUG07	07AUG07		13		2,404.80	le	EM//TB	=32h	ır ;								
PHIL-39		Final align and baseline measurements	3	08AUG07	10AUG07		13		5,410.80	li	EM//TB	=72h	nr ;								
PHIL-40		Perform 25% of welding & measure	2	13AUG07	14AUG07		13		2,404.80		EM//TE										
PHIL-41		Perform 50% of welding & measure	2	15AUG07	16AUG07		13		2,404.80		EM//TE	3 =321	nr;								
PHIL-42		Perform 75% of welding & measure	2	17AUG07	20AUG07		13		2,404.80		EM//TE	3 =32	nr ;								
PHIL-43		finish welding & measure	2	21AUG07	22AUG07		13		2,404.80	ı	EM//TE	3 =32	hr ;								
PHIL-44		Analyze data; write report	14	23AUG07	12SEP07		13		0.00		1										
R1810-2050		Consulting support for welding trials	56	25JUN07*	12SEP07		1,261		89,320.00		lewi=2	0 \$ k ;	parsel	ls=50	\$k ;						
			1	•	•				·												

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Resource Loaded Schedule
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Activity	MILE-	Activity	Duration	Baseline	Baseline	Shifts	Total	%	Proposed														
ID	stones (level 2	Description	(work days	Start	Finish		Float	cmplt	Budgeted	FY07	,	FY	08		FY09	,	FY	/10	1	FY11		FY12	
	& 3)		,-								Ш					Ш	Ш	Ш	Ш	ШШ	Ш	ШШ	
R1810-2003	Trial tensioning	test on prototype with UT	3	09JUL07*	11JUL07	1	43		6,834.00	I			05-	: 41=0	arti.								
		• • • • • • • • • • • • • • • • • • • •				-																	
R1810-2005		nd shim test on prototype	12	16JUL07*	31JUL07	1	29		20,588.00						=02\$k								
R1810-2011		hanisms, metro equipt &positioning	26	23AUG07*	28SEP07	1	15		60,058.00						11=40								
R1810-2013	Procure alignm	ent mechanisms, fiducials, lifting	40	02AUG07*	27SEP07	1	17		61,960.00		JEM	//TB	=40	0hr ; 4	11=25	ŝk;							
R1810-2052	Bushing test B-	-C	7	18JUL07*	26JUL07	1	27		8,416.80	l e	m//tl	=11	2										
R1810-2017	Determine fiduo	cial types&locations	11	09JUL07*	23JUL07	1	35		19,085.00	0E	M//T	B =2	220h	r ; 41=	-02\$k	;							
R1810-2001	Misc Hardware	and hardware rework (1/2 fte loe)	260	01MAY07	14MAY08	1	1,095	LOE	87,913.87			1	41	=10\$k	; EM/	/TB =90	60hr ;						
Setup																							
						T .																	
R1810-2023		olding 20 deg fixture	4	09JUL07*	12JUL07	1	70		8,564.00			=80;											
R1810-2025	Install SECOND	Holding 20 deg fixture	3	01AUG07*	03AUG07	1	45		7,061.00	IE	EM//	ГВ =6	60hr	; 41=	02\$k ;								
R1810-2027	Install THIRD H	olding 20 deg fixture	6	06AUG07*	13AUG07	1	45		11,570.00	le le	EM//	TB =	120	hr ; 41	=02\$k	.;							
R1810-2029	Install LAST Ho	olding 20 deg fixture	3	14AUG07*	16AUG07	1	45		7,061.00	l li	EM//	TB =	60h	r ; 41=	02\$k ;	j.							
R1810-2004	Receive Drawin	gs & Hardware (shims & Bolts)	7	12SEP07	20SEP07	1	163		10,521.00		[ЕМ	//TB	=14	Ohr ;									
R1810-2006	Surface grind s	et of metal shims for qualificat	4	17SEP07*	20SEP07	1	23		18,036.00		IЕМ	//TB	=24	0hr ;									
R1810-207	Compress alum	nina shims and sort	6	20SEP07*	27SEP07	1	18		9,018.00		I EM	//TB	=12	0hr ;									
R1810-209	Perform metrol	ogy setup & checks	22	10SEP07*	09OCT07	1	10		7,672.82		■E/	1//TB	3 =10	00hr ;									
R1810-2021	Tools&tooling a	available for FPA operations	2	01OCT07	02OCT07	1	15		9,744.40		ΕM	1//TB	=40)hr ;41	=5k								
R1810-2002	Test out Equip	& Procedures	7	02OCT07	10OCT07	1	9		11,215.40		lev	1//TB	3 =14	10hr ;									
R1810-2108	HARDWARE,DF	RAWINGS,& PROCURES AVAILABLE STATIO	N 0		23OCT07	1	0		0.00	,	V												
Pre-Measuring	g and fitup checks										Ť								++++				Н
	nent of MCHP A1,B1,C1 fla	anges																					
S21-1.01	Verify mating M	IC's A1,B1,C1	4	20JUL07*	25JUL07	1	1		6,012.00	ΙE	М//Т	В =	-80h	r ;									
S21-1.02	Epoxy paint all	close fitting interfacing surfac	3	26JUL07	30JUL07	1	1		4,509.00	le	М//Т	В =	=60h	r;									
S21-2.01	Set A1 on pre-i	measured fixt, "B" side down	1	31JUL07	31JUL07	1	1		1,503.00	le	M//	В =	=20h	ır ;									
S21-2.02	Align to the cor	nical seats locking into of 8	2	01AUG07	02AUG07	1	1		0.00	Iz	ME	г -	= 40	;									
S21-2.03	Estab global co	oord sys on mc geometry. Meas monu	7	03AUG07	13AUG07	1	1		0.00	1z	ZME	т :	=140	; (
S21-2.04	Meas tooling ba	all monuments on winding form.	1	14AUG07	14AUG07	1	1		0.00	l:	ZME	т :	=20	;									
S21-2.05	Scan the "A" fla	ange of the Type-A1 coil.	1	15AUG07	15AUG07	1	1		0.00	li	ZME	т :	=20										
S21-2.07	Remove A1 coi	I from stand	1	16AUG07	16AUG07	1	1		1,503.00	l	EM//	ТВ	=20	hr :									
S21-2.08	Measure B1 "A'	' flange	14	17AUG07	06SEP07	1	1		3,006.00		lem/	/ТВ	=40))hr : 2	ZMET	=220	.0 :						
S21-2.11	Measure C1 "A'		13	07SEP07	25SEP07	1	1		3,006.00						ZMET								
S21-2.14		A1-A2 "A" flange	13	26SEP07	12OCT07	1	1		3,158.62							T =2							
S21-3.02	+	st article f/assy process qu	4	15OCT07	18OCT07	1	1		6,408.80					80hr	1								
S21-4.02		ogy set-up and checks	2	190CT07	22OCT07	1	1		0.00			VIII I			1								
S21-3.03		ussembly A1B1C1	0		22OCT07	1	1		0.00		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	**- '		,									
	nent of MCHP A2,B2,C2 fla	<u> </u>	•			'	- 1		5.50		V		+			+++			##	+++		+++	+
S22-1.01		IC's of MCHP will come together	4	23OCT07	26OCT07		4		6,408.80		IF	M//TF	В =	80hr									
S22-1.02		close fitting interfacing surfac	3	29OCT07	31OCT07		4		4,806.60					:60hr									
		·	TCZ				Sheet 3	8 of on	·	Ш		.,,,		77'"	<u>'1111</u>	<u>Ш</u>	Ш	шШ	Щ	шШ	<u>Ш</u>		<u>Ш</u>
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ID ´	MILE- Activity stones Description	Duration (work	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted										$\overline{}$	
	(level 2	days	Juli	1 111311		i iJai	опри	Daugeteu	FY07	FY08		FY09	Ш	FY10	'	FY	11	F	FY12
S22-2.08	Measure B2 "A" flange	14	01NOV07	20NOV07	1	4		3,204.40		■EM//TB	=40hr	; ZME	 T =2		шш	ш		-Ш	
S22-2.11	Measure C2 "A" flange	13	21NOV07	11DEC07	1	4		3,204.40		₩ЕМ//ТВ				220					
S22-2.14	Measure Type A1-A2 "A" flange	13	12DEC07	08JAN08	1	4		3,204.40		 ∎EM//T		r;ZN		=220					
S22-3.02	Compress alumina shims sort by thickness	4	09JAN08	14JAN08		4		6,408.80			B =80h				ľ				
S22-4.02	Perform metrology set-up and checks	2	15JAN08	16JAN08		4		0.00		ZMET									
S22-4.03	Ready For Preassembly A2B2C2	0	1007 11100	16JAN08		4		0.00				5							
	ent of MCHP A3,B3,C3 flanges																	+	
S23-1.01	Verify mating MC's of MCHP will come together	4	17JAN08	22JAN08		4		6,408.80		Іем//т	B =80I	ır ;							
S23-1.02	Epoxy paint all close fitting interfacing surfac	3	23JAN08	25JAN08		4		4,806.60		I EM//1	B =60	nr;							
S23-2.01	Set the A3 coil on fixture, A side flange down	1	28JAN08	28JAN08		4		1,602.20		IEM//	B =20	nr;							
S23-2.02	Align to the conical seats locking into min of 8	2	29JAN08	30JAN08		4		0.00		IZME ⁻	F =40	;							
S23-2.03	Measure monuments on fixture and walls.	7	31JAN08	08FEB08		4		0.00		Izme	Г =14	0 ;							
S23-2.04	Measure tooling ball monuments	1	11FEB08	11FEB08		4		0.00		Izme	T =20								
S23-2.05	Scan the B flange of A3	1	12FEB08	12FEB08		4		0.00		IZME	T =20	;							
S23-2.07	Remove A3 move to holding area.	1	13FEB08	13FEB08		4		1,602.20		IEM//	TB =20	hr ;							
S23-2.08	Measure B3 "A" flange	14	14FEB08	04MAR08		4		3,204.40		∎ем⁄	/TB =4	Ohr ; i	ZMET	=220) ;				
S23-2.11	Measure C3 "A" flange	13	05MAR08	21MAR08		4		3,204.40		ПЕМ	//TB =4	0hr ;	ZMET	=220	o ;				
S23-2.14	Measure Type A3-A4 "A" flange	13	24MAR08	09APR08		4		3,204.40		0ev	1//TB =	40hr :	ZMET	=22	20 ;				
S23-3.02	Compress alumina shims sort by thickness	4	10APR08	15APR08		4		4,806.60		len	///TB =	60hr	;						
S23-4.02	Perform metrology set-up and checks	2	16APR08	17APR08		4		0.00		Izn	иЕТ =	40 ;							
S23-4.03	Ready For Preassembly A3B3C3	0	18APR08	17APR08		4		0.00		1									
Pre measureme	nt of MCHP A4,B4,C4 flanges		1	<u>'</u>															
S24-1.01	Verify mating MC's of MCHP will come together	4	18APR08	23APR08		4		6,408.80		lE	W//TB :	=80hr	;						
S24-1.02	Epoxy paint all close fitting interfacing surfac	3	24APR08	28APR08		4		4,806.60		lE	M//TB	=60hr	;						
S24-2.08	Measure B4 "A" flange	14	29APR08	16MAY08	1	4		3,204.40		DE	M//TB	=40hr	; ZME	:T =2	220	;			
S24-2.11	Measure C4 "A" flange	13	19MAY08	05JUN08	1	4		3,204.40		H	EM//TB	=40hr	; ZME	ET =	220	;			
S24-2.14	Measure Type A3-A4 "A" flange	13	06JUN08	24JUN08	1	4		3,204.40			EM//TB	=40h	r;ZM	ŒT =	=220	;			
S24-3.02	Compress alumina shims sort by thickness	4	25JUN08	30JUN08		4		6,408.80			IEM//TE	=80h	nr ;						
S24-4.02	Perform metrology set-up and checks	2	01JUL08	02JUL08		4		0.00			ZMET	=40	;						
S24-4.03	Ready For Preassembly A4B4C4	0	03JUL08	02JUL08		4		0.00			l								
	ent of MCHP A5,B5,C5 flanges		T	T							_								
S25-1.01	Verify mating MC's of MCHP will come together	4	03JUL08	09JUL08		4		6,408.80			IEM//TE								
S25-1.02	Epoxy paint all close fitting interfacing surfac	3	10JUL08	14JUL08		4		4,806.60			EM//TE								
S25-2.01	Set the A5 coil on fixture, A side flange down	1	15JUL08	15JUL08		4		1,602.20			IEM//TI								
S25-2.02	Align to the conical seats locking into min of 8	2	16JUL08	17JUL08		4		0.00			ZMET								
S25-2.03	Measure monuments on fixture and walls.	7	18JUL08	28JUL08		4		0.00			ZMET	=14	0 ;						
S25-2.04	Measure tooling ball monuments	1	29JUL08	29JUL08		4		0.00			ZMET								
S25-2.05	Scan the B flange of A5	1	30JUL08	30JUL08		4		0.00			ZMET								
S25-2.07	Remove A5 move to holding area.	1	31JUL08	31JUL08		4		1,602.20	Ш		IEM//T	B =20	hr ;			Ш		Ш	Ш
un Dato	18JUL07 07:31	ETCZ	N	CSX Project		Sheet 3	9 of 99												—
un Date	103000 07:31			e Loaded Sch EAC															

Activity ID	MILE- stones	Activity Description	Duration (work	Baseline Start	Baseline Finish	Shifts	Total Float	% Proposed cmplt Budgeted										
ID.	(level 2 & 3)	Description	days	Start	riiisii		l loat C	cripit Budgeteu	FY07	FY08	ШШ	FY09	F	FY10	F	Y11	F	Y12
S25-2.08	Measure B5 "A"	flange	14	01AUG08	20AUG08		4	3,204.40			ВЕМ//ТІ	3 =40hr	r ; ZME	ШШШ ЕТ =2	220 ;			H
S25-2.11	Measure C5 "A"	flange	13	21AUG08	09SEP08		4	3,204.40			 ■ EM//1	B =40h	nr;ZM	1ET =	:220 ;			
S25-2.14	Measure Type As	5-A6 "A" flange	13	10SEP08	26SEP08		4	3,204.40			■ EM//	TB =40I	hr;ZN	MET =	=220 ;	;		
S25-3.02	Compress alumi	na shims sort by thickness	4	29SEP08	02OCT08		4	4,877.10			IEM//	TB =60)hr ;					
S25-4.02	Perform metrolo	gy set-up and checks	2	03OCT08	06OCT08		4	0.00			IZME	T =40	,					
S25-4.03	Ready For Preas		0	07OCT08	06OCT08		4	0.00			1							
	nent of MCHP A6,B6,C6 fla												+				+	H
S26-1.01	1 1	C's of MCHP will come together	4	07OCT08	10OCT08		4	6,596.80			IEM/	TB =80	Ohr ;					
S26-1.02	Epoxy paint all c	lose fitting interfacing surfac	3	13OCT08	15OCT08		4	4,947.60			IEM/	TB =60	Ohr ;					
S26-2.08	Measure B6 "A"	flange	14	16OCT08	04NOV08	1	4	3,298.40			В ЕМ	//TB =4	lOhr ; ž	ZMET	=220	;		
S26-2.11	Measure C6 "A"	flange	13	05NOV08	21NOV08	1	4	3,298.40			0ev	1//TB =4	40hr ;	ZMET	=220	:		
S26-2.14	Measure Type A		13	24NOV08	12DEC08	1	4	3,298.40				M//TB =			=220			
S26-3.02		na shims sort by thickness	4	15DEC08	18DEC08		4	6,596.80				M//TB =						
S26-4.02	-	gy set-up and checks	2	19DEC08	22DEC08		4	0.00					=40 ;					
S26-4.03	Ready For Preas	<u> </u>	0	23DEC08	22DEC08		4	0.00				- IVIL I	-40 ,					
	Sub Assy A1-B1-C1	201121, 702000		202200	ZZZZGG		-	0.00										+
Pre-assemble	•																	
S21-5.00	BEGIN A-A Pre-a	ssembly	0		23OCT07	1	0	0.00	_	,								
S21-5.01	Place A2 "B" sid	de down. Obtain fiduals	2	24OCT07	25OCT07	1	0	3,204.40	İΕ	M//TB	=40hr ;							
S21-5.02	Align to the coni	cal seats locking into 8.	1	26OCT07	26OCT07	1	0	0.00	lz	mer=20								
S21-5.03	Meas monument	s on fixture & walls.	2	29OCT07	30OCT07	1	0	0.00	lz	met=40								
S21-5.04		coil identical to A1-A2 fit up	1	31OCT07	31OCT07	1	0	801.10		M//TB	=10hr ·							
S21-5.05		itors on the MC to see deflec	1	01NOV07	01NOV07	1	0	3,204.40		M//TB								
S21-5.06		1 modular coil into position.	1	02NOV07	02NOV07	1	0	1,602.20		:M//TB								
S21-5.07		s bottom coil. Jack to .002"	1	05NOV07	05NOV07	1	0	1,602.20		:M//TB								
S21-5.07	+	position as was done inA1A2 fit	1	06NOV07	06NOV07	1	0	1,602.20		M//TB								
S21-5.09		osition as was done maraz m	2	07NOV07	08NOV07	1	0	3,204.40										
	Torque to 50%	ant Timbton half and rechards					0	-		M//TB								
S21-5.1		est Tighten bolt and recheck.	1 -	09NOV07	09NOV07	1	-	1,602.20		EM//TB								
S21-5.11	Meas tooling bal		5	12NOV07	16NOV07	1	0	0.00		ZMET								
S21-5.12	 	cally. Re-torque all studs to 50%	3	19NOV07	21NOV07	1	0	4,806.60		EM//TB	=60hr							
S21-5.14	Install A-A locat		2	22NOV07	23NOV07	1	0	3,204.40		EM//TB								
S21-5.15	1	uts,shims. Identify shim locations	1	26NOV07	26NOV07	1	0	1,602.20		EM//TB	=20hr	;						Ш
A-B Assembly				071101/07	001101/07			0.004.40										
S21-6.01	+ +	" side down. Obtain fiduals	2	27NOV07	28NOV07	1	0	3,204.40			=40hr	;						
S21-6.02	+ + -	cal seats locking into 8.	1	03DEC07	03DEC07	1	0	0.00		ZMET	=20 ;							
S21-6.03		s on fixture & walls.	2	04DEC07	05DEC07	1	0	0.00		ZMET	=40 ;							
S21-6.04	Place the an initi	al set shims on coil	2	06DEC07	07DEC07	1	0	3,204.40		EM//TB	=40hr	;						
S21-6.041	Stuff shim bag w	//fiberglass & place on wing	1	10DEC07	10DEC07	1	0	400.55		EM//TB	=05hr	;						
S21-6.05	Lower the Type-	B coil onto the Type-A coil.	1	11DEC07	11DEC07	1	0	1,602.20		ІЕМ//ТВ	=20hr	;						
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un Date	18JUL07 07:31		2102		CSX Project e Loaded Sch	edule	Jileet 40	01 33										
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Activity ID	MILE- Activity	Duration	Baseline	Baseline	Shifts	Total	% cmplt	Proposed						_						
טו	stones Description	(work days	Start	Finish		Float	cmplt	Budgeted	FY07	FY08	П	FY	09		FY10	,	F	Y11		FY1:
S21-6.06	& 3) Measure monuments on A coil. Jack to .002"	1	12DEC07	12DEC07	1	0		1,602.20			-20	hr ·	Ш	Ш	Щ	Ш			Ш	Ш
S21-6.061	instl dial indicators for x-y positioning	1	13DEC07	13DEC07	1	0		1,602.20		EM//TE										
S21-6.001 S21-6.07	Perform the X-Y positioning of the B coil.	1	14DEC07	14DEC07	1	0		1,602.20		EM//TE										
S21-6.07	Install remaining metal shims torque to 50%	2	17DEC07	18DEC07	1	0		3,204.40												
S21-6.09	<u> </u>	1	19DEC07	19DEC07	1	0		·		IEM//TE										
	Make "wiggle" test Tighten bolt and recheck.	5	20DEC07	04JAN08	1	0		1,602.20		IEM//TE										
S21-6.1 S21-6.11	Measure the tooling balls on both coils.	3		09JAN08	1	0		0.00 4,806.60		ZMET										
S21-6.11	Loosen studs, adjust shims. Re-torque to 50%. Install alumina shims. Re-torque to 50%.	1	07JAN08	10JAN08	1	0				IEM//T										
	•	1	10JAN08	11JAN08	1	0		1,602.20		IEM//T										
S21-6.13	Make "wiggle" test Tighten bolt and recheck.	-	11JAN08		-	-		1,602.20		IEM//T										
S21-6.14	Measuretooling balls . The max devi .007" .	5	14JAN08	18JAN08	1	0		0.00		IZMET			; 							
S21-6.15	Loosen studs, adjust shims. Re-torque to 50%.	3	21JAN08	23JAN08	1	0		4,806.60		IEM//										
S21-6.16	Install bushings. Tighten back to 50%	10	24JAN08	06FEB08	1	0		16,022.00		EM//			;							
S21-6.17	Complete tightening of flange bolts to 100%.	1	07FEB08	07FEB08	1	0		1,602.20			ГВ =:		;							
S21-6.18	Measuretooling balls . The max devi .007" .	2	08FEB08	11FEB08	1	0		0.00		IZME			, 							
S21-6.19	Scan the "B" flange of Type-B coil	1	12FEB08	12FEB08	1	0		1,602.20		IEM//	TB =	20hr	;							
AB - C Asseml S21-7.01	Place "A/B" assy, "A" coil dwn, on 40deg fix.	3	13FEB08	15FEB08	1	0		4,806.60		IEM/	TB =	SObr	1.							
S21-7.02	Align to the conical seats locking into a min of	1	18FEB08	18FEB08	1	0		0.00		IZME		20								
S21-7.02	Measure the monuments on the fixture & the walls	•	19FEB08	20FEB08	1	0		0.00		IZME			, .							
S21-7.03 S21-7.04	Place initial set metal shims on the coil	2	21FEB08	22FEB08	1	0		3,204.40			тв =	40 40br	, 							
S21-7.0 4 S21-7.05	Lower the Type-C coil onto the Type-B coil.	1	25FEB08	25FEB08	1	0		1,602.20			TB =		, .							
S21-7.06	Meas monuments on A coil to eval displacement.	1	26FEB08	26FEB08	1	0		0.00		IZME		20111	, .							
S21-6.062	instl dial indicators for x-y positioning	1	27FEB08	27FEB08	1	0		1,602.20			/TB =		, .							
S21-7.07	Perform the X-Y positioning of the coil.	1	28FEB08	28FEB08	1	0		1,602.20			/тв =									
S21-7.08	Install remaining metal shims torque to 50%	2	29FEB08	03MAR08	1	0		3,204.40			/тв =									
S21-7.09	"wiggle" test Tighten bolt and recheck.	1	04MAR08	04MAR08	1	0		1,602.20			/тв =									
S21-7.1	Measure the tooling balls on all coils.	5	05MAR08	11MAR08	1	0		0.00		Izm		=100	, .							
S21-7.11	adjust shims locally. Re-torque all studs to 50%	3	12MAR08	14MAR08	1	0		4,806.60			//TB		,							
S21-7.12	linstall alumina shims. Re-torque all studs to	1	17MAR08	17MAR08	1	0		1,602.20			//TB									
S21-7.13	"wiggle" test Tighten bolt and recheck.	1	18MAR08	18MAR08	1	0		1,602.20			//TB									
S21-7.14	Measure the tooling balls on all coils.	5	19MAR08	25MAR08	1	0		8,011.00			//TB									
S21-7.15	adjust shims locally. Re-torque all studs to 50	3	26MAR08	28MAR08	1	0		4,806.60			I//TB									
S21-7.16	Install bushings	10	31MAR08	11APR08	1	0		16,022.00			///TB									
S21-7.17	Complete tightening of flange bolts to 100%.	1	14APR08	14APR08	1	0		1,602.20			и//тв		1							
S21-11.01	Identify primary fiducials for positioning Sta 3	1	15APR08	15APR08	1	0	-	1,602.20			и//тв									
S21-7.18	Final metrology meas. Scan "B" flangeType-C coil		16APR08	22APR08	1	0		0.00			иет									
	board Welded hims							- 77						+++	++	++			#	$^{+}$
S21-8.01	Tack weld inboard shims	2	23APR08	24APR08	1	0		3,204.40		le	M//TB	=40	hr ;							

Run Date 18JUL07 07:31

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ETCZ NCSX Project Sheet 41 of 99
Resource Loaded Schedule
EAC

Activity	MILE-	Activity	Duration	Baseline	Baseline	Shifts	Total	%	Proposed									
ID	stones (level 2	Description	(work days	Start	Finish		Float	cmplt	Budgeted	FY07	FY0	3	FY09	ı	FY10	F	Y11	FY12
	`&3)															ШШ		ЩЩ
S21-10.01	al Service & interface det		2	25APR08	28APR08	1			2 204 40				401					
		support bladders				1	6		3,204.40				=40hr ;					
S21-10.02		rice runs/connections	8	25APR08	06MAY08	<u> </u>			12,817.60				=160hr	;				
S21-10.03		n all shim spaces	1	25APR08	25APR08	1	7		1,602.20			EM//TB	=20hr ;					
DOE-1	nents/Transfer to Holdin	g Area scheduled station 3 lifts	0		27MAR08	1	o		0.00									
DOE-2	DOE review lift		30	28MAR08	08MAY08	1	0		0.00		Y.							
DOE-3		of scheduled station 3 lifts	0		08MAY08	1	0		0.00			,						
S21-11.03		ength on all tension fasteners	0	09MAY08	08MAY08	1	0		0.00			EM//TB	=00hr					
S21-11.04	Mark part for id		0	09MAY08	08MAY08	1	0		0.00				=00hr					
S21-11.05	Install lift supp		2	07MAY08	08MAY08	1	0		3,204.40				=40hr					
S21-11.06		tand & measure weight of assy	1	09MAY08	09MAY08	1	0		1,602.20				=20hr					
S21-11.07		to holding area.	0	12MAY08	09MAY08	1	0		0.00				=00hr					
L	Sub Assy A2-B2-C2	to notating area.		12111111100	John C. Co.	<u> </u>			0.00				, =00m	•				
A-B Assembly	700 712 DZ 02																	
S22-6.01	A2 "A" flange	dwn, 20deg fixt.Obtain fiduci	1	13FEB08	13FEB08	1	4		1,602.20		lem	//TB =	20hr ;					
S22-6.02	Align to the co	nical seats locking into a min of	1	14FEB08	14FEB08	1	4		0.00		lzm	ET =	20 ;					
S22-6.03	Measure monu	ments on fixture and on the walls.	2	15FEB08	18FEB08	1	4		0.00		Izm	ET =	40 ;					
S22-6.04	Place alumina	grind inboard weld shims on coil.	2	19FEB08	20FEB08	1	4		3,204.40		IEN	//TB =	:40hr ;					
S22-6.05	Lower the Type	e-B coil onto the Type-A coil.	1	21FEB08	21FEB08	1	4		1,602.20		IEN	//TB =	20hr ;					
S22-6.06	Meas monume	nts on A coil. Jack to within .002"	1	22FEB08	22FEB08	1	4		0.00		Izv	ET =	20 ;					
S22-6.07	Perform the X-	Y positioning of the B coil.	1	25FEB08	25FEB08	1	4		0.00		lzm	et=20						
S22-6.08	Install studs, si	upernuts, torque to 50% of final	2	26FEB08	27FEB08	1	4		3,204.40		len	1//TB =	=40hr ;					
S22-6.09	"wiggle" test T	ighten bolt and recheck.	1	28FEB08	28FEB08	1	4		1,602.20		len	//TB =	=20hr ;					
S22-6.1	Meas tooling ba	alls on both coils. max devi .007"	5	29FEB08	06MAR08	1	4		0.00		Izn	1ET =	=100 ;					
S22-6.11	adjust shims lo	ocally. Re-torque all studs to 50%	3	07MAR08	11MAR08	1	4		4,806.60		ler	///ТВ	=60hr ;					
S22-6.12	Install bushing	js	10	12MAR08	25MAR08	1	4		16,022.00		lε	м//тв	=200hr ;					
S22-6.13	Complete tight	ening of flange bolts to 100%.	1	26MAR08	26MAR08	1	4		1,602.20		le	M//TB	=20hr ;					
S22-6.14	Measure the to	oling balls on both coils.	3	27MAR08	31MAR08	1	4		0.00		lz	MET	=60 ;					
S22-6.15	Scan the "B" fl	ange of Type-B coil	1	01APR08	01APR08	1	4		1,602.20		l∈	M//TB	=20hr ;					
AB - C Assemb	oly																	
S22-7.01		coil dwn, 40deg fixt.Obtain fiduc	2	02APR08	03APR08	1	4		3,204.40		lE	M//TB	=40hr ;					
S22-7.02		nical seats locking into min of 8	1	04APR08	04APR08	1	4		0.00		lz	MET	=20 ;					
S22-7.03	Measure monu	ments on fixture and walls.	2	07APR08	08APR08	1	4		0.00		Iz	MET	=40 ;					
S22-7.04	Place alumin g	rind inboard weld shims on coil.	2	09APR08	10APR08	1	4		3,204.40		lE	M//TB	=40hr ;					
S22-7.05	Lower the Type	-C coil onto the Type-B coil.	1	11APR08	11APR08	1	4		1,602.20		lE	M//TB	=20hr ;					
S22-7.06	Meas monume	nts on A coil for displacements.	1	14APR08	14APR08	1	4		0.00		Iz	MET	=20 ;					
S22-7.07	Perform the X-	Y positioning of the coil.	1	15APR08	15APR08	1	4		1,602.20		le	M//TB	=20hr ;					
S22-7.08	Install studs, su	upernuts, torque to 50% of fina	2	16APR08	17APR08	1	4		3,204.40		le	M//TB	=40hr ;					
					<u> </u>													
Run Date	18JUL07 07:31		ETCZ		CSX Project e Loaded Scho	edule	Sheet 4	2 of 99										
© Primave	era Systems, Inc.			Nesoult	EAC													

Activity ID	MILE- stones Activity Description	Duration (work	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted	FY07	FY0			FY09			Y10		FY11		FY
	(level 2 & 3)	days										Ш	109	Ш	Шİ		ПΠ		ШТ	П
622-7.09	"wiggle" test Tighten bolt and recheck.	1	18APR08	18APR08	1	4		1,602.20			EM//T	B =2	20hr	;						-
S22-7.1	Measure the tooling balls on all coils.	5	21APR08	25APR08	1	4		0.00		l	ZMET	-	100	;						
S22-7.11	Install bushings Replace nut and tighten to 50%	10	28APR08	09MAY08	1	4		16,022.00		1]ем//1	В =	:200h	nr ;						
S22-7.12	Complete tightening of flange bolts to 100%.	1	12MAY08	12MAY08	1	4		1,602.20			IEM//1	ГВ =	-20hr	;						
S22-7.13	Measure the tooling balls on both coils.	4	13MAY08	16MAY08	1	4		0.00			IZME	г =	=80	;						
Tack Weld Inb	oard Welded hims																			Ħ
S22-8.01	Tack weld all inboard shims to one flange	1	19MAY08	19MAY08	1	4		1,602.20			EM//	гв =	=20hr	٠;						
Complete Loca	al Service & interface details	'		'	'															П
S22-10.01	Install all wing support bladders	2	20MAY08	21MAY08	1	4		3,204.40			IEM//	тв :	=40hi	r ;						
S22-10.02	local service connections on each MC.	8	22MAY08	03JUN08	1	4		12,817.60			∦ EM//	ТВ	=160	hr ;						
S22-10.03	Inject stycast to fill in all shim spaces	1	04JUN08	04JUN08	1	4		1,602.20			lem//	тв	=20h	r;						
	ments/Transfer to Holding Area																			
S22-11.01	Install or identify three primary fiducials	1	05JUN08	05JUN08	1	4		1,602.20			IEM//	ТВ	=20h	r;						
S22-11.02	Final metrology measurement of all fiducials.	5	06JUN08	12JUN08	1	4		0.00			ØZME	ΞT	=100) ;						
S22-11.03	Tension tester measure bolt length	1	13JUN08	13JUN08	1	4		801.10			lem/	/ТВ	=10h	nr ;						
S22-11.04	Mark part for identification	0	16JUN08	13JUN08	1	4		0.00			IEM/	/ТВ	=00h	nr ;						
S22-11.05	Install lift support beams	2	16JUN08	17JUN08	1	4		3,204.40			IEM/	/ТВ	=40l	nr ;						
S22-11.06	3 Remove from stand Move A2-B2-C2 to holding area	2	18JUN08	19JUN08	1	4		3,204.40			IEM/	/ТВ	=401	hr ;						
Station 2-Mod	lular Coil Subassembly-FP#2																			
S23-A3B3C3	Assemble/Align Mod-Coils A3/B3/C3	140	12MAY08	26NOV08	1	0		171,696.21					A//TD		105h.	. 714		740		
S24-A4B4C4	Assemble/Align Mod-Coils A4/B4/C4	97	03JUL08	18NOV08	1	16		108,078.85								; ZM				
	lular Coil Subassembly-FP#3	31	0330108	10140400	'	10		100,076.63				EIV	1// 1 B	=13	Som	; ZME	= 1	=620	,	
otation z-wou	idiai Coli Subassembiy-FF#3																			
S25-A5B5C5	Assemble/Align Mod-Coils A5/B5/C5 (under 1 shift	86	07OCT08*	16FEB09	1	5		125,174.28					вм/	/ТВ	=1518	Bhr ; Z	ZMET	=52	3 ;	
S25A5B5C52	Assemble/Align Mod-Coils A5/B5/C5 (under 2 shift	20	17FEB09*	16MAR09	2	5		50,053.22					■ EM	1//TB	=607	'hr ; 2	ZMET	=21	2 ;	
S26-A6B6C6	Assemble/Align Mod-Coils A6/B6/C6	36	23DEC08*	19FEB09	1	4		56,732.48				C]ем/	//TB	=688	nr ; Zi	MET	=320	;	
S26A6B6C62	Assemble/Align Mod-Coils A6/B6/C6	24	20FEB09*	25MAR09	2	4		53,351.62					■EN	и//тв	=64	7hr ; :	ZMET	=30	0 ;	
Station 3 Setu	p/Preparations/General																			т
D4040 0400	Misc M&S	0.5	00 4 DD00*	00 1111 00		4.000		0.540.00												
R1810-3102		65	03APR08*	03JUL08	1	1,060		6,540.00			41= 	:05\$1	C ;							
R1810-3104	Procure 3 legged actuator system	20	01OCT07*	26OCT07	· ·	134		56,244.00		41=43\$										
R1810-3106	Load test 3 ledded actuator system	3	29OCT07	31OCT07	1	134		7,690.56		EM//TE		г;								
R1810-3108	Procure ,Fabricate 3 legged actuator lift fixtur	20	01OCT07*	26OCT07	1	129		7,848.00		41=06\$										
04040 0440	Load Test 3 legged actuator lift fixtur	8	29OCT07	07NOV07	1	129		10,254.08		EM//TE										
		4	01OCT07*	04OCT07	1	143		5,127.04		M//TB										
R1810-3150	Fab New legs									Details to be										
R1810-3150 R1810-3103	Install station 3 platforms (8 required)	4	20NOV07	23NOV07	1	111		22,052.32			B =11									
R1810-3112 R1810-3150 R1810-3103 R1810-3107 R1810-3109	<u> </u>		20NOV07 26NOV07 04DEC07	23NOV07 03DEC07 05DEC07	1	111 111 111		22,052.32 13,080.00 52,320.00		EM//T										

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NCSX Project Resource Loaded Schedule EAC

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
Station 3-Asse	emble Mod Coils and VV	/SA-FP#1							
D4040 0400	Barrin Otatian O			00844 D00*	T		F0	0.00	
R1810-2109	Begin Station 3		0	03MAR08*	05844 D00	1	56	0.00	Y
S31-1.01		site monuments	3	03MAR08	05MAR08	1	56	7,422.60	
S31-1.02		inted tracks and VV base support	5	06MAR08	12MAR08	1	56	9,319.00	
S31-1.03		CHP CG location.	2	13MAR08	14MAR08	1	56	3,204.40	
S31-2.01		pport cart assemblies	4	17MAR08	20MAR08	1	56	6,408.80	
S31-2.02	Verify cart motion		2	21MAR08	24MAR08	1	56	3,204.40	EM//TB =40hr ;
S31-2.03	-	par support weldment	0	25MAR08	24MAR08	1	56	0.00	
S31-2.04	Position left MC	HP on the cart assembly	1	12MAY08	12MAY08	1	22	1,602.20	EM//TB =20hr ;
S31-2.05	Secure left MCH	P on support cart base.	2	13MAY08	14MAY08	1	22	3,204.40	EM//TB =40hr ;
S31-2.06	Measure monun	nents on left MCHP and walls	5	15MAY08	21MAY08	1	22	0.00	■EM//TB =00hr ; ZMET =100 ;
S31-2.07	Set positioning	stop on the cart	1	22MAY08	22MAY08	1	22	1,602.20	EM//TB =20hr ;
S31-3.01	Move right base	support cart to its final positi	1	23MAY08	23MAY08	1	22	801.10	EM//TB =10hr ;
S31-3.02	Lift the right sid	e MCHP and position	1	20JUN08	20JUN08	1	4	1,602.20	EM//TB =20hr ;
S31-3.03	Temporary faste	eners bring the parts together.	0	23JUN08	20JUN08	1	4	0.00	IEM//TB =00hr ;
S31-3.04	AirLoc Wedgem	ount leveler to take load.	0	23JUN08	20JUN08	1	4	0.00	EM//TB =00hr ;
S31-3.05	Install temp sca	ffolding to install flange hw	1	23JUN08	23JUN08	1	4	1,602.20	IEM//TB =20hr ;
S31-3.06	Install bolts and	shims	1	24JUN08	24JUN08	1	4	1,602.20	EM//TB =20hr ;
S31-3.07	Tighten flange fa	asteners to 50%	1	25JUN08	25JUN08	1	4	1,602.20	EM//TB =20hr ;
S31-3.08	Perform metrolo	ogy measurements	5	26JUN08	02JUL08	1	4	0.00	IEM//TB
S31-3.09	Perform position	n adjust on right side MCHP	2	03JUL08	07JUL08	1	4	3,204.40	 EM//TB =40hr ;
S31-3.1	Verify position of	of the VV support hanger	3	08JUL08	10JUL08	1	4	0.00	EM//TB =00hr ; ZMET =60 ;
S31-3.11	Remove flange	hardware and temp platforms	1	11JUL08	11JUL08	1	4	1,602.20	EM//TB =20hr ;
S31-4.01	EMeasure monu	ments on the MCHP's &walls.	2	14JUL08	15JUL08	1	4	2,616.00	
S31-4.02	Place all of the I	aser screens	2	16JUL08	17JUL08	1	4	3,204.40	EM//TB =40hr ;
S31-4.03	Determine laser	alignment.	1	18JUL08	18JUL08	1	4	1,602.20	EM//TB =20hr ;
S31-4.04	mount the mila	on the screens.	1	21JUL08	21JUL08	1	4	0.00	IEM//TB =00hr ;
S31-4.05	Disengage MCH	P's to move the left MCHP.	1	22JUL08	22JUL08	1	4	1,602.20	EM//TB =20hr ;
S31-4.06	Remove both Mo		2	23JUL08	24JUL08	1	4	3,204.40	
S31-5.01	Remove the adj	ustor bar support from left side.	0	25JUL08	24JUL08	1	4	0.00	
S31-5.02		ort support stand.	2	25JUL08	28JUL08	1	4	3,204.40	
S31-5.03	Install VVSA to I		1	29JUL08	29JUL08	1	4	1,602.20	
S31-5.04		A to base & NBI port sprt stand.	2	30JUL08	31JUL08	1	4	3,204.40	
S31-6.01		rotection components on the VV	1	01AUG08	01AUG08	1	4	801.10	
S31-6.02	<u> </u>	Wedgemount in lower position.	0	04AUG08	01AUG08	1	4	0.00	
S31-6.02		CHP over the VV.	2	04AUG08	05AUG08	1	4	3,204.40	
S31-6.04	Re-install the lef		0	04AUG08	05AUG08	1	4	0.00	
S31-6.04 S31-6.05		nts to properly align MCHP.	2	06AUG08	07AUG08	1	4	3,204.40	
001-0.00	wake aujustme	по то ргорену анун молг.		UUAUGUO	UI AUGUO	<u>'</u>	<u> </u>	3,204.40	
un Date	18JUL07 07:31		ETCZ		CSX Project e Loaded Sch	edule	Sheet 44 of 99		

Transfer load to the AirLoc Wedgemount leveler. move the MCHP to the left 1/2". Position AirLoc Wedgemount lowered position. move the right MCHP over the VV move the left MCHP to its final position. engage the preinstalled Type-A flange bushings. Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	(work days) 0 0 0 2 1 1 0 1 0 4	08AUG08 08AUG08 08AUG08 08AUG08 12AUG08 13AUG08 14AUG08	7AUG08 07AUG08 07AUG08 07AUG08 11AUG08 12AUG08 13AUG08	1 1 1 1 1	4 4 4 4 4	cmplt	0.00 0.00 0.00 0.00 3,204.40	FY07	FYO	IEM,	FY09 //TB =00h //TB =00h //TB =00h //TB =40h	nr ; nr ; nr ;	FY10		FY'	11		FY1:
Transfer load to the AirLoc Wedgemount leveler. move the MCHP to the left 1/2". Position AirLoc Wedgemount lowered position. move the right MCHP over the VV move the left MCHP to its final position. engage the preinstalled Type-A flange bushings. Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	0 0 2 1 1 0 1 0 4	08AUG08 08AUG08 08AUG08 12AUG08 13AUG08 14AUG08	07AUG08 07AUG08 11AUG08 12AUG08 13AUG08	1 1 1 1	4 4		0.00 0.00			IEM/	//TB =00h //TB =00h	nr ; nr ;						
move the MCHP to the left 1/2". Position AirLoc Wedgemount lowered position. move the right MCHP over the VV move the left MCHP to its final position. engage the preinstalled Type-A flange bushings. Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	0 0 2 1 1 0 1 0 4	08AUG08 08AUG08 08AUG08 12AUG08 13AUG08 14AUG08	07AUG08 07AUG08 11AUG08 12AUG08 13AUG08	1 1 1 1	4		0.00 0.00			IEM/	//TB =00h //TB =00h	nr ; nr ;						
Position AirLoc Wedgemount lowered position. move the right MCHP over the VV move the left MCHP to its final position. engage the preinstalled Type-A flange bushings. Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	0 2 1 1 0 1 0 4	08AUG08 08AUG08 12AUG08 13AUG08 14AUG08	07AUG08 11AUG08 12AUG08 13AUG08	1	4 4		0.00			IEM	//TB =00h	nr ;						
move the right MCHP over the VV move the left MCHP to its final position. engage the preinstalled Type-A flange bushings. Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	2 1 1 0 1 0 4	08AUG08 12AUG08 13AUG08 14AUG08	11AUG08 12AUG08 13AUG08 13AUG08	1	4													
move the left MCHP to its final position. engage the preinstalled Type-A flange bushings. Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	1 1 0 1 0 4	12AUG08 13AUG08 14AUG08 14AUG08	12AUG08 13AUG08 13AUG08	-	4		0,200				7 ID - TOI							
engage the preinstalled Type-A flange bushings. Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	0 1 0 4	13AUG08 14AUG08 14AUG08	13AUG08 13AUG08	-	- 1		801.10			IEM	//TB =10h							
Temporary fasteners bring the parts together. AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	0 4	14AUG08 14AUG08	13AUG08		4		801.10				//TB =10h							
AirLoc Wedgemount leveler up to take the load. Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	0 4	14AUG08	+	1	4		0.00				//TB =00h							
Remove laser screens Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	4		14AUG08	1	4		801.10				//TB =10h							
Install temp scaffolding to install flange hw Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%	4	15AUG08	14AUG08	1	4		0.00				//TB =00h							
Install bolts, alumina and inboard weld shims. Tighten flange fasteners to 50%		15AUG08	20AUG08	1	4		6,408.80				I//TB =80h							
Tighten flange fasteners to 50%	2	21AUG08	22AUG08	1	4		3,204.40				I//TB =40h							
	1	25AUG08	25AUG08	1	4		1,602.20				1//TB =20							
"wiggle" test Tighten bolt and recheck.	1	26AUG08	26AUG08	1	4		1,602.20				1//TB =20							
Perform metrology measurements	5	27AUG08	03SEP08	1	4		0.00			1	///TB =00	1	иет	=100) :			
Perform position adjustments right side MCHP	3	04SEP08	08SEP08	1	4		4,806.60				M//TB =60				,			
Remove SISSCO actuator from right MCHP.	0	09SEP08	08SEP08	1	4		0.00				M//TB =00							
Pre-fit & Install bushings	10	28AUG08	11SEP08	1	4		16,022.00				M//TB =20							
Tighten nuts 100%. & Measure	1	12SEP08	12SEP08	1	4		1,602.20				W//TB =20							
partially weld the inboard shim.	15	15SEP08	03OCT08	1	4		24,174.00			ÎE	M//TB =3	00hr :						
<u> </u>	5	06OCT08	10OCT08	1	4		0.00			_			ZMET	=10	00 :			
	2	13OCT08	14OCT08	1	4										1			
	1	15OCT08	15OCT08	1	4		1,649.20											
	1	16OCT08	16OCT08	1	4		1,649.20			le	EM//TB =:	20hr ;						
**	4	17OCT08	22OCT08	1	4		6,596.80			le	EM//TB =	30hr :						
	2	23OCT08	24OCT08	1	4		3,298.40											
transfer the unit to the transfer support frame	2	27OCT08	28OCT08	1	4		6,596.80			le le	EM//TB =	80hr ;						
2 Transfer Period 1 to Station 5 in NCSX TC	1	29OCT08	29OCT08	1	4		3,298.40			1	EM//TB =	40hr ;						
e Mod Coils and VVSA-FP#2																		Т
Install Station 2 site manuments		200CT09	031/01/09	1	4		7 744 60											
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			+								IEM//TB	=00hr	; ZME	 	100	;		
Set positioning stop on the cart	1	11DEC08	111DEC08	⊢ 1	. 0						BELLE III			+1.11				
_	Transfer Period 1 to Station 5 in NCSX TC	Attach VV permanent vertical supports Attach temporary VV vertical supports 1 Transfer load to vertical supports. Install VV lateral supports and align Prepare VVSA for transport. 2 transfer the unit to the transfer support frame Transfer Period 1 to Station 5 in NCSX TC 1 Mod Coils and VVSA-FP#2 Install Station 3 site monuments Install floor mounted tracks and VV base support Establish the MCHP CG location. Install MCHP support cart assemblies Verify cart motion. Install adjustor bar support weldment Position left MCHP on the cart assembly Secure left MCHP on support cart base. Measure monuments on left MCHP and walls	Attach VV permanent vertical supports Attach temporary VV vertical supports Transfer load to vertical supports. Install VV lateral supports and align Prepare VVSA for transport. transfer the unit to the transfer support frame Transfer Period 1 to Station 5 in NCSX TC Install Station 3 site monuments Install Station 3 site monuments Install floor mounted tracks and VV base support Establish the MCHP CG location. Install MCHP support cart assemblies Verify cart motion. Install adjustor bar support weldment Position left MCHP on support cart base. Measure monuments on left MCHP and walls 5 04DEC08	Attach VV permanent vertical supports Attach temporary VV vertical supports 1 150CT08 150CT08 Transfer load to vertical supports. 1 160CT08 160CT08 Install VV lateral supports and align Prepare VVSA for transport. 2 230CT08 240CT08 transfer the unit to the transfer support frame 2 270CT08 280CT08 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 Mod Coils and VVSA-FP#2 Install Station 3 site monuments 3 300CT08 03NOV08 Install floor mounted tracks and VV base support 5 04NOV08 10NOV08 Establish the MCHP CG location. 2 11NOV08 12NOV08 Install MCHP support cart assemblies 4 13NOV08 18NOV08 Verify cart motion. 2 19NOV08 20NOV08 Install adjustor bar support weldment 9 21NOV08 20NOV08 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 Secure left MCHP on support cart base. 2 02DEC08 03DEC08 Measure monuments on left MCHP and walls 5 04DEC08	Attach VV permanent vertical supports 2 130CT08 140CT08 1 Attach temporary VV vertical supports 1 150CT08 1 Transfer load to vertical supports. 1 160CT08 1 Install VV lateral supports and align 4 170CT08 220CT08 1 Prepare VVSA for transport. 2 230CT08 240CT08 1 transfer the unit to the transfer support frame 2 270CT08 280CT08 1 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 1 Mod Coils and VVSA-FP#2 1 290CT08 1 200CT08 1 Install Station 3 site monuments 3 300CT08 03NOV08 1 Install Floor mounted tracks and VV base support 5 04NOV08 10NOV08 1 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 Install MCHP support cart assemblies 4 13NOV08 1 Verify cart motion. 2 19NOV08 20NOV08 1 Inst	Attach VV permanent vertical supports 2 13OCT08 14OCT08 1 4 Attach temporary VV vertical supports 1 15OCT08 15OCT08 1 4 Transfer load to vertical supports. 1 16OCT08 16OCT08 1 4 Install VV lateral supports and align 4 17OCT08 22OCT08 1 4 Prepare VVSA for transport. 2 23OCT08 24OCT08 1 4 transfer the unit to the transfer support frame 2 27OCT08 28OCT08 1 4 Transfer Period 1 to Station 5 in NCSX TC 1 29OCT08 29OCT08 1 4 Install Station 3 site monuments 3 30OCT08 29OCT08 1 4 Install Gloor mounted tracks and VV base support 5 04NOV08 10NOV08 1 4 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 4 Install MCHP support cart assemblies 4 13NOV08 18NOV08 1 4 Verify cart motion. 2 19NOV08 20NOV08 1 4 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 1 0 Secure left MCHP on support cart base. 2 02DEC08 03DEC08 1 0 Measure monuments on left MCHP and walls 5 04DEC08 10DEC08 1	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 Transfer load to vertical supports. 1 160CT08 160CT08 1 4 Install VV lateral supports and align 4 170CT08 220CT08 1 4 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 transfer the unit to the transfer support frame 2 270CT08 280CT08 1 4 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 1 4 Mod Coils and VVSA-FP#2 Install Station 3 site monuments 3 300CT08 03NOV08 1 4 Install floor mounted tracks and VV base support 5 04NOV08 10NOV08 1 4 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 4 Install MCHP support cart assemblies 4 13NOV08 18NOV08 1 4 Verify cart motion. 2 19NOV08 20NOV08 1 4 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 1 0 Measure monuments on left MCHP and walls 5 04DEC08 10DEC08 1 0	Attach VV permanent vertical supports 2 13OCT08 14OCT08 1 4 3,298.40 Attach temporary VV vertical supports 1 15OCT08 15OCT08 1 4 1,649.20 Transfer load to vertical supports. 1 16OCT08 16OCT08 1 4 1,649.20 Install VV lateral supports and align 4 17OCT08 22OCT08 1 4 6,596.80 Prepare VVSA for transport. 2 23OCT08 24OCT08 1 4 3,298.40 transfer the unit to the transfer support frame 2 27OCT08 28OCT08 1 4 6,596.80 Transfer Period 1 to Station 5 in NCSX TC 1 29OCT08 29OCT08 1 4 3,298.40 Mod Coils and VVSA-FP#2 Install Station 3 site monuments 3 30OCT08 03NOV08 1 4 7,741.60 Install floor mounted tracks and VV base support 5 04NOV08 10NOV08 1 4 9,643.00 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 4 9,643.00 Install MCHP support cart assemblies 4 13NOV08 18NOV08 1 4 6,596.80 Verify cart motion. 2 19NOV08 20NOV08 1 4 0.00 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 1 0 1,649.20 Secure left MCHP on support cart base. 2 02DEC08 10DEC08 1 0 0.000	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports. 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 220CT08 1 4 6,596.80 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 6,596.80 Transfer the unit to the transfer support frame 2 270CT08 280CT08 1 4 6,596.80 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 1 4 3,298.40 Mod Coils and VVSA-FP#2 Install Station 3 site monuments 3 300CT08 03NOV08 1 4 7,741.60 Install floor mounted tracks and VV base support 5 04NOV08 10NOV08 1 4 9,643.00 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 4 9,643.00 Install MCHP support cart assemblies 4 13NOV08 1 4 6,596.80 Verify cart motion. 2 19NOV08 20NOV08 1 4 0.00 Position left MCHP on the cart assembly 1 01DEC08 1 0 1,649.20 Secure left MCHP on support cart base. 2 02DEC08 03DEC08 1 0 0.00 Measure monuments on left MCHP and walls 5 04DEC08 10DEC08 1 0 0.00	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports. 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 220CT08 1 4 6,596.80 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 6,596.80 Transfer the unit to the transfer support frame 2 270CT08 280CT08 1 4 6,596.80 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 1 4 3,298.40 Mod Coils and VVSA-FP#2 Install Station 3 site monuments 3 300CT08 03NOV08 1 4 7,741.60 Install floor mounted tracks and VV base support 5 04NOV08 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11NOV08 12NOV08 1 4 9,643.00 Install MCHP support cart assemblies 4 13NOV08 1 4 9,596.80 Verify cart motion. 2 19NOV08 20NOV08 1 4 0.00 Position left MCHP on support weldment 0 21NOV08 20NOV08 1 4 0.00 Position left MCHP on support cart base. 2 02DEC08 03DEC08 1 0 0.000 Measure monuments on left MCHP and walls 5 04DEC08 10DEC08 1 0 0.000	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports. 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 220CT08 1 4 6,596.80 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 6,596.80 Transfer the unit to the transfer support frame 2 270CT08 280CT08 1 4 6,596.80 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 1 4 3,298.40 Install Station 3 site monuments 3 300CT08 03NOV08 1 4 7,741.60 Install Station 3 site monuments 5 04NOV08 10NOV08 1 4 9,643.00 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 4 9,643.00 Install MCHP support cart assemblies 4 13NOV08 18NOV08 1 4 9,596.80 Verify cart motion. 2 19NOV08 20NOV08 1 4 0.00 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 1 0 1,649.20 Secure left MCHP on support cart base. 2 02DEC08 03DEC08 1 0 3,298.40 IEM/TB = IE	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports. 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 220CT08 1 4 6,596.80 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 6,596.80 transfer the unit to the transfer support frame 2 270CT08 280CT08 1 4 6,596.80 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 1 4 3,298.40 Install Station 3 site monuments 3 300CT08 03NOV08 1 4 7,741.60 Install Gloor mounted tracks and VV base support 5 04NOV08 10NOV08 1 4 9,643.00 Install MCHP support cart assemblies 4 13NOV08 18NOV08 1 4 9,596.80 Install MCHP support cart assemblies 4 13NOV08 1 4 0,000 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 1 0 3,298.40 IEM/TB =40hr : EM/TB =4	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 220CT08 1 4 6,596.80 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 6,596.80 Item/TB = 40hr : Image: Lem/TB Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports. 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 220CT08 1 4 6,596.80 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 6,596.80 Item/TB = 20hr : Image: lem/TB = 20hr : Image: lem	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 22OCT08 1 4 6,596.80 Prepare VVSA for transport. 2 23OCT08 24OCT08 1 4 6,596.80 Transfer the unit to the transfer support frame 2 27OCT08 28OCT08 1 4 6,596.80 Transfer Period 1 to Station 5 in NCSX TC 1 29OCT08 29OCT08 1 4 3,298.40 Install Station 3 site monuments 3 30OCT08 3NOV08 1 4 7,741.60 Install Glor mounted tracks and VV base support 5 04NOV08 10NOV08 1 4 9,643.00 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 4 9,643.00 Install MCHP support cart assemblies 4 13NOV08 1 4 9,696.80 Verify cart motion. 2 19NOV08 20NOV08 1 4 0.00 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 1 0 0.00 Measure monuments on left MCHP and walls 5 04DEC08 10DEC08 1 0 0.00 IEM/TB =40hr : IEM/TB =40hr : IEM/TB =40hr : IEM/TB =40hr : IEM/TB =20hr : IEM/TB =40hr : IEM/TB =20hr : IEM/TB =20hr : IEM/TB =40hr : IEM/TB =20hr : IEM/TB =20hr : IEM/TB =40hr : IEM/TB =20hr : IEM/TB =40hr	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV vertical supports 1 150CT08 150CT08 1 4 1,649.20 Transfer load to vertical supports. 1 160CT08 160CT08 1 4 1,649.20 Install VV lateral supports and align 4 170CT08 220CT08 1 4 5,596.80 Prepare VVSA for transport. 2 230CT08 240CT08 1 4 5,596.80 Transfer the unit to the transfer support frame 2 270CT08 280CT08 1 4 5,596.80 Transfer Period 1 to Station 5 in NCSX TC 1 290CT08 290CT08 1 4 3,298.40 Install Station 3 site monuments 3 300CT08 03NOV08 1 4 9,643.00 Establish the MCHP CG location. 2 11NOV08 12NOV08 1 4 3,298.40 Install MCHP support cart assemblies 4 13NOV08 18NOV08 1 4 3,298.40 Verify cart motion. 2 19NOV08 20NOV08 1 4 0.00 Position left MCHP on the cart assembly 1 01DEC08 01DEC08 1 0 0.00 Measure monuments on left MCHP and walls 5 04DEC08 10DEC08 1 0 0.00 IEM/TB =40hr : IEM	Attach VV permanent vertical supports 2 130CT08 140CT08 1 4 3,298.40 Attach temporary VV 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Activity	MILE-	Activity	Duration	Baseline	Baseline	Shifts	Total	%	Proposed	
ID	stones (level 2	Description	(work days	Start	Finish		Float	cmplt	Budgeted	FY07 FY08 FY09 FY10 FY11 FY12
	` & 3)									
S32-3.01		Move right base support cart to its final positi	1	12DEC08	12DEC08	1	0		824.60	IEM//TB =10hr ;
S32-3.02		Lift the right side MCHP and position	1	15DEC08	15DEC08	1	0		1,649.20	EM//TB =20hr ;
S32-3.03		Temporary fasteners bring the parts together.	0	16DEC08	15DEC08	1	0		0.00	IEM//TB =00hr ;
S32-3.04		AirLoc Wedgemount leveler to take load.	0	16DEC08	15DEC08	1	0		0.00	IEM//TB =00hr ;
S32-3.05		Install temp scaffolding to install flange hw	1	16DEC08	16DEC08	1	0		1,649.20	lEM//TB =20hr ;
S32-3.06		Install bolts and shims	1	17DEC08	17DEC08	1	0		1,649.20	IEM//TB =20hr ;
S32-3.07		Tighten flange fasteners to 50%	1	18DEC08	18DEC08	1	0		1,649.20	IEM//TB =20hr ;
S32-3.08		Perform metrology measurements	5	19DEC08	05JAN09	1	0		0.00	■EM//TB =00hr ; ZMET =100 ;
S32-3.09		Perform position adjust on right side MCHP	2	06JAN09	07JAN09	1	0		3,298.40	EM//TB =40hr ;
S32-3.1		Verify position of the VV support hanger	3	08JAN09	12JAN09	1	0		0.00	I EM//TB =00hr ; ZMET =60 ;
S32-3.11		Remove flange hardware and temp platforms	1	13JAN09	13JAN09	1	0		1,649.20	EM//TB =20hr ;
S32-4.01		EMeasure monuments on the MCHP's &walls.	2	14JAN09	15JAN09	1	0		2,794.00	EM//TB =00hr ; ZMET =40 ;41=2k
S32-4.02		Place all of the laser screens	2	16JAN09	19JAN09	1	0		3,298.40	EM//TB =40hr ;
S32-4.03		Determine laser alignment.	1	20JAN09	20JAN09	1	0		1,649.20	IEM//TB +20hr ;
S32-4.04		mount the milar on the screens.	1	21JAN09	21JAN09	1	0		0.00	lEM//TB =00hr ;
S32-4.05		Disengage MCHP's to move the left MCHP.	1	22JAN09	22JAN09	1	0		1,649.20	lEM//TB =20hr ;
S32-4.06		Remove both MCHP's.	2	23JAN09	26JAN09	1	0		3,298.40	IEM//TB =40hr ;
S32-5.01		Remove the adjustor bar support from left side.	0	27JAN09	26JAN09	1	0		0.00	IEM//TB =00hr ;
S32-5.02		Install VV NBI port support stand.	2	27JAN09	28JAN09	1	0		3,298.40	[EM//TB =40hr ;
S32-5.03		Install VVSA to base support	1	29JAN09	29JAN09	1	0		1,649.20	EM//TB
S32-5.04		Secure the VVSA to base & NBI port sprt stand.	1	30JAN09	30JAN09	2	0		3,298.40	EM//TB =40hr ;
S32-6.01		Install bumper protection components on the VV	1	30JAN09	30JAN09	2	0		824.60	EM//TB
S32-6.02		Position AirLoc Wedgemount in lower position.	0	02FEB09	30JAN09	2	0		0.00	EM//TB
S32-6.03		move the left MCHP over the VV.	1	02FEB09	02FEB09	2	0		3,298.40	EM//TB =40hr ;
S32-6.04		Re-install the left adjustor bar.	0	03FEB09	02FEB09	2	0		0.00	EM//TB
S32-6.05		Make adjustments to properly align MCHP.	1	03FEB09	03FEB09	2	0		3,298.40	EM//TB =40hr ;
S32-6.06		Transfer load to the AirLoc Wedgemount leveler.	0	04FEB09	03FEB09	2	0		0.00	EM//TB
S32-6.07		move the MCHP to the left 1/2".	0	04FEB09	03FEB09	2	0		0.00	EM//TB
S32-7.01		Position AirLoc Wedgemount lowered position.	0	04FEB09	03FEB09	2	0		0.00	EM//TB
S32-7.02		move the right MCHP over the VV	1	04FEB09	04FEB09	2	0		3,298.40	EM//TB =40hr ;
S32-7.03		move the left MCHP to its final position.	1	04FEB09	04FEB09	2	0		824.60	EM//TB
S32-7.04		engage the preinstalled Type-A flange bushings.	1	04FEB09	04FEB09	2	0		824.60	EM//TB
S32-7.05		Temporary fasteners bring the parts together.	0	05FEB09	04FEB09	2	0		0.00	EM//TB
S32-7.06		AirLoc Wedgemount leveler up to take the load.	1	05FEB09	05FEB09	2	0		824.60	EM//TB =10hr ;
S32-7.07		Remove laser screens	0	06FEB09	05FEB09	2	0		0.00	EM//TB
S32-7.08		Install temp scaffolding to install flange hw	2	06FEB09	09FEB09	2	0		6,596.80	I EM//TB =80hr ;
S32-7.09		Install bolts, alumina and inboard weld shims.	1	10FEB09	10FEB09	2	0		3,298.40	EM//TB
S32-7.1		Tighten flange fasteners to 50%	1	11FEB09	11FEB09	2	0		1,649.20	
<u> </u>					1					
Doto		1111 07 07:24	ETCZ	NC	CSX Project		Sheet 46	6 of 99		

Run Date 18JUL07 07:31 © Primavera Systems, Inc.

NCSX Project Resource Loaded Schedule ETCZ EAC

Sheet 46 of 99

Activity	MILE- stones	Activity Description	Duration (work	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted												
II.	(level 2	Description	days	Start	Fillisii		rioat	Cilipit	Budgeted	F Y07	F 	Y08	ш	FY09) 	F\ 	/10 	F	Y11	НП	FY12
S32-7.11	& 3)	"wiggle" test Tighten bolt and recheck.	1	11FEB09	11FEB09	2	0		1,649.20					IEM	//TB	 =20hr	:			ш	
S32-7.12		Perform metrology measurements	2	12FEB09	13FEB09	2	0		0.00					ІЕМ	//TB	=00hr	; ZME	T =1	100 ;	,	
S32-7.13		Perform position adjustments right side MCHP	2	16FEB09	17FEB09	2	0		4,947.60					IEN	//TB	=60hr	;				
S32-7.14		Remove SISSCO actuator from right MCHP.	0	18FEB09	17FEB09	2	0		0.00					lev	//TB	=00hr	:				
S32-7.15		Pre-fit & Install bushings	5	12FEB09	18FEB09	2	0		16,492.00					_		=200h	r :				
S32-7.16		Tighten nuts 100%. & Measure	1	19FEB09	19FEB09	2	0		1,649.20							=20hr	:				
S32-8.01		partially weld the inboard shim.	4	20FEB09	25FEB09	2	0		24,738.00							=300h	r ;				
S32-8.02		Final complete MC scan verify period alignment.	2	26FEB09	27FEB09	2	0		0.00					len	I//TB	=00hr	; ZME	T =	100	:	
S32-9.01		Attach VV permanent vertical supports	1	02MAR09	02MAR09	2	0		3,298.40					len	1//TB	=40hr	;				
S32-9.02		Attach temporary VV vertical supports	1	03MAR09	03MAR09	2	0		1,649.20							=20hr					
S32-9.03		Transfer load to vertical supports.	1	04MAR09	04MAR09	2	0		1,649.20							=20hr					
S32-9.04		Install VV lateral supports and align	2	05MAR09	06MAR09	2	0		6,596.80							=80hr					
S32-9.05		Prepare VVSA for transport.	1	09MAR09	09MAR09	2	0		3,298.40							=40hı					
S32-10.01		transfer the unit to the transfer support frame	1	10MAR09	10MAR09	2	0		6,596.80							=80hi					
S32-10.02	2	Transfer Period 2 to Station 5 in NCSX TC	1	11MAR09	11MAR09	2	0		3,298.40							=40h	1				
		lod Coils and VVSA-FP#3		111111111111111111111111111111111111111	111111111111111111111111111111111111111				0,20000							101	,				
S33-1.01		Install Station 3 site monuments	2	12MAR09	13MAR09	2	0		7,741.60					41	=02\$; EN	1//TB =	=60hr	;		
S33-1.02		Install floor mounted tracks and VV base support	2	16MAR09	17MAR09	2	0		9,643.00					I 41	=01\$	k ; EN	1//TB =	=100hr	· ;		
S33-1.03		Establish the MCHP CG location.	1	18MAR09	18MAR09	2	0		3,298.40					lEi	и//тв	=40h	r ;				
S33-2.01		Install MCHP support cart assemblies	2	19MAR09	20MAR09	2	0		6,596.80					lEi	и//тв	=80h	r ;				
S33-2.02		Verify cart motion.	1	23MAR09	23MAR09	2	0		3,298.40					lE	м//тв	=40h	r ;				
S33-2.03		Install adjustor bar support weldment	0	24MAR09	23MAR09	2	0		0.00					ΙE	м//тв	=00h	r ;				
S33-2.04		Position left MCHP on the cart assembly	1	24MAR09	24MAR09	2	0		1,649.20					lE	м//тв	=20h	r ;				
S33-2.05		Secure left MCHP on support cart base.	1	25MAR09	25MAR09	2	0		3,298.40					lE	м//тв	=40h	r ;				
S33-2.06		Measure monuments on left MCHP and walls	2	26MAR09	27MAR09	2	0		0.00					lE	м//тв	=00h	r ; ZM	ET =	=100	;	
S33-2.07		Set positioning stop on the cart	1	30MAR09	30MAR09	2	0		1,649.20					ΙE	м//тв	=20h	ır ;				
S33-3.01		Move right base support cart to its final positi	1	31MAR09	31MAR09	2	0		824.60					ΙE	м//тв	=10h	ır ;				
S33-3.02		Lift the right side MCHP and position	1	01APR09	01APR09	2	0		2,473.80					lE	м//тв	=30h	ır ;				
S33-3.03		Temporary fasteners bring the parts together.	0	02APR09	01APR09	2	0		0.00					lE	м//тв	=00h	ır ;				
S33-3.04		AirLoc Wedgemount leveler to take load.	0	02APR09	01APR09	2	0		0.00					lE	м//тв	=00h	ır ;				
S33-3.05		Install temp scaffolding to install flange hw	1	02APR09	02APR09	2	0		1,649.20					le	M//TE	=20h	nr ;				
S33-3.06		Install bolts and shims	1	02APR09	02APR09	2	0		1,649.20					le	M//TE	=20h	nr ;				
S33-3.07		Tighten flange fasteners to 50%	1	03APR09	03APR09	2	0		1,649.20					le	M//TE	=20h	nr ;				
S33-3.08		Perform metrology measurements	2	06APR09	07APR09	2	0		0.00					le	M//TE	=001	nr;ZN	1ET	=100	;	
S33-3.09		Perform position adjust on right side MCHP	1	08APR09	08APR09	2	0		3,298.40					le	M//TE	=40	nr ;				
S33-3.1		Verify position of the VV support hanger	2	09APR09	10APR09	2	0		0.00					le	M//TE	3 =001	nr;ZN	1ET	=60	;	
S33-3.11		Remove flange hardware and temp platforms	2	09APR09	10APR09	2	0		1,649.20					le	M//TE	3 =201	nr ;				
S33-4.01		EMeasure monuments on the MCHP's &walls.	1	13APR09	13APR09	2	0		2,794.00									ИΕΤ	=40	;41=2	2k

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Resource Loaded Schedule EAC

S33-4.02 Place all of the laser screens	Activity ID	MILE- stones	Activity Description	Duration (work	Baseline Start	Baseline Finish	Shifts	Total Float	% Proposed cmplt Budgeted		Y07	FY	08	F	Y09	F	Y10	FY	11	FY
S33-4.03 Determine laser alignment.				days																
1633-4.04 mount the milar on the screens. 0 16APR09 15APR09 2 0 0.00 16AP30	33-4.02		Place all of the laser screens	1	14APR09	14APR09	2	0	3,29	8.40					IEM//T	B =40	hr ;			
33-4.05 Disengage MCHP's to move the left MCHP. 1 16APR00 16APR00 2 0 1,646.20	33-4.03		Determine laser alignment.	1	15APR09	15APR09	2	0	1,64	9.20					IEM//T	B =20	hr ;			
1	33-4.04		mount the milar on the screens.	0	16APR09	15APR09	2	0		0.00					IEM//T	B =00	hr ;			
Remove the adjustor bar support from left side. 0 20APR09 77APR09 2 0 0.00 16APR07 335.02 5	33-4.05		Disengage MCHP's to move the left MCHP.	1	16APR09	16APR09	2	0	1,64	9.20					IEM//T	B =20	hr ;			
1 20APR09 20APR09 2 0 3.288.40	33-4.06		Remove both MCHP's.	1	17APR09	17APR09	2	0	3,29	8.40					IEM//T	B =40	hr ;			
1	33-5.01		Remove the adjustor bar support from left side.	0	20APR09	17APR09	2	0		0.00					IEM//T	B =00	hr ;			
Sacure the VVSA to base & NBI port spir stand.	33-5.02		Install VV NBI port support stand.	1	20APR09	20APR09	2	0	3,29	8.40					IEM//T	B =40	hr ;			
Sa3-6.01 Install bumper protection components on the VV	33-5.03		Install VVSA to base support	1	21APR09	21APR09	2	0	1,64	9.20					IEM//T	B =20	hr ;			
Sa3-6.02 Position AirLoc Wedgemount in lower position. 0 24APR09 22 0 0.00 0.00 16MM709 233-6.03 move the left MCHP over the VV. 1 24APR09 24APR09 2 0 0.00 16MM209 1.00 1.0	33-5.04		Secure the VVSA to base & NBI port sprt stand.	1	22APR09	22APR09	2	0	3,29	8.40					IEM//T	B =40	hr ;			
1	33-6.01		Install bumper protection components on the VV	1	23APR09	23APR09	2	0	82	4.60					IEM//T	B =10	00hr ;			
Sa3-6.04 Re-install the left adjustor bar. 0 27APR09 2 0 0.00 0	33-6.02		Position AirLoc Wedgemount in lower position.	0	24APR09	23APR09	2	0		0.00					IEM//T	B =00	hr ;			
33-6.05 Make adjustments to properly align MCHP. 1 27APR09 27APR09 2 0 3,298.40	33-6.03		move the left MCHP over the VV.	1	24APR09	24APR09	2	0	4,12	3.00					IEM//T	B =50	Ohr ;			
Transfer load to the AirLoc Wedgemount leveler. 0 28APR09 27APR09 2 0 0.00	33-6.04		Re-install the left adjustor bar.	0	27APR09	24APR09	2	0		0.00					IEM//T	B =00	Ohr ;			
33-07 move the MCHP to the left 1/2". 0 28APR09 27APR09 2 0 0.00 16M/TB -00hr 1 128APR09 27APR09 2 0 0.00 16M/TB -00hr 1 128APR09 28APR09 2 0 0.00 16M/TB -10hr 1 128APR09 28APR09 2 0 0.00 1 1 1 1 1 1 1 1 1	33-6.05		Make adjustments to properly align MCHP.	1	27APR09	27APR09	2	0	3,29	8.40					IEM//T	B =40	Ohr ;			
Position AirLoc Wedgemount lowered position. 0 28APR09 27APR09 2 0 0.00	33-6.06		Transfer load to the AirLoc Wedgemount leveler.	0	28APR09	27APR09	2	0		0.00					Іем//т	B =00	Ohr ;			
2837-7.02 move the right MCHP over the VV	33-6.07		move the MCHP to the left 1/2".	0	28APR09	27APR09	2	0		0.00					ІЕМ//Т	B =00	Ohr ;			
33-7.03 move the left MCHP to its final position. 1 28APR09 28APR09 2 0 824.60 824.60	33-7.01		Position AirLoc Wedgemount lowered position.	0	28APR09	27APR09	2	0		0.00					IEM//T	B =00	Ohr ;			
33-7.04 engage the preinstalled Type-A flange bushings. 1 29APR09 29APR09 2 0 824.60	33-7.02		move the right MCHP over the VV	1	28APR09	28APR09	2	0	3,29	8.40					IEM//T	B =40	Ohr ;			
33-7.05 Temporary fasteners bring the parts together. 0 30APR09 29APR09 2 0 0.00	33-7.03		move the left MCHP to its final position.	1	28APR09	28APR09	2	0	82	4.60					IEM//T	B =10	Ohr ;			
337.06 AirLoc Wedgemount leveler up to take the load. 1 30APR09 30APR09 2 0 824.60 16MTB = 100hr 1 18MTB = 300hr 1 18M	33-7.04		engage the preinstalled Type-A flange bushings.	1	29APR09	29APR09	2	0	82	4.60					IEM//T	B =10	Ohr ;			
Remove laser screens 0 01MAY09 30APR09 2 0 0.00	33-7.05		Temporary fasteners bring the parts together.	0	30APR09	29APR09	2	0		0.00					Іем//т	B =00	Ohr ;			
1	33-7.06		AirLoc Wedgemount leveler up to take the load.	1	30APR09	30APR09	2	0	82	4.60					І ЕМ//Т	B =10	00hr ;			
Sa3-7.09 Install bolts, alumina and inboard weld shims. 1	33-7.07		Remove laser screens	0	01MAY09	30APR09	2	0		0.00					Ієм//т	B =00	Ohr ;			
Tighten flange fasteners to 50%	33-7.08		Install temp scaffolding to install flange hw	2	29APR09	30APR09	2	0	6,59	6.80					Іем//т	B =80	Ohr ;			
"wiggle" test Tighten bolt and recheck.	33-7.09		Install bolts, alumina and inboard weld shims.	1	01MAY09	01MAY09	2	0	3,29	8.40					ІЕМ//Т	B =40	Ohr ;			
Perform metrology measurements 2 06MAY09 07MAY09 2 0 0 0.00 IEM/TB =00hr : ZMET =10 IEM/TB =	33-7.1		Tighten flange fasteners to 50%	1	04MAY09	04MAY09	2	0	1,64	9.20					ІЕМ//Т	B =20	Ohr ;			
Perform position adjustments right side MCHP 2 08MAY09 11MAY09 2 0 0 4,947.60	33-7.11		"wiggle" test Tighten bolt and recheck.	1	05MAY09	05MAY09	2	0	1,64	9.20					ІЕМ//Т	B =20	Ohr ;			
Perform position adjustments right side MCHP 2 08MAY09 11MAY09 2 0 4,947.60 12MAY09 11MAY09 2 0 0.00 12MAY09 11MAY09 2 0 0.00 12MAY09 12MAY09 2 0 0.00 16,492.00	33-7.12		Perform metrology measurements	2	06MAY09	07MAY09	2	0		0.00					I EM//1	ΓB =00	Ohr ; ZI	MET =	=100	:
Remove SISSCO actuator from right MCHP. 0 12MAY09 11MAY09 2 0 0.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00 16,492.00	33-7.13			2	08MAY09	11MAY09	2	0	4,94	7.60					IEM//	ΓB =6	Ohr :			
Pre-fit & Install bushing. 5 06MAY09 12MAY09 2 0 16,492.00 16,492.00				0		11MAY09	2	0												
Tighten nuts 100%. & Measure 1 13MAY09 13MAY09 2 0 1,649.20 IEM/TB =20hr : 333-8.01 partially weld the inboard shim. 7 14MAY09 22MAY09 2 0 24,738.00 IEM/TB =300hr : 333-8.02 Final complete MC scan verify period alignment. 3 26MAY09 28MAY09 2 0 0.00 IEM/TB =00hr : 2MET =10 233-9.01 Attach VV permanent vertical supports 1 29MAY09 2 0 3,298.40 IEM/TB =40hr : 333-9.02 Attach temporary VV vertical supports 1 01JUN09 01JUN09 2 0 1,649.20 IEM/TB =20hr : 333-9.02 IEM/TB =20hr : 333-9.02 IEM/TB =20hr : 334-9.02 IEM/TB =20hr : 344-9.20 IEM/			-	5			2	0												
S33-8.01 partially weld the inboard shim. 7 14MAY09 22MAY09 2 0 24,738.00 24,738.00 24,738.00 24,738.00 24,738.00 24,738.00 24,738.00 24,738.00 23,738.00 24,738				1				0												
Signature Sign				7				0												
33-9.01 Attach VV permanent vertical supports 1 29MAY09 2 0 3,298.40 EM/TB =40hr : 333-9.02 Attach temporary VV vertical supports 1 01JUN09 01JUN09 2 0 1,649.20 EM/TB =20hr :								-										MET	=100	
33-9.02 Attach temporary VV vertical supports 1 01JUN09 01JUN09 2 0 1,649.20 EM//TB =20hr :								-										· · ·	.50	
			·	-																
33-9.04 Install VV lateral supports and align 1 03JUN09 03JUN09 2 0 6,596.80 EM//TB =80hr ;			••	-				-												

	Activity ID	MIL stor (lev	nes el 2	Activity Description	Duration (work days	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted	FY07	FY08	FY09	FY10	FY11	FY12
	S33-9.05			Prepare VVSA for transport.	1	04JUN09	04JUN09	2	0		3,298.40			lem	//TB =40hr ;		
П	S33-10.01			transfer the unit to the transfer support frame	1	05JUN09	05JUN09	2	0		6,596.80			IEM	//TB =80hr ;		
П	S33-10.02	2	2	Transfer Period 3 to Station 5 in NCSX TC	1	08JUN09	08JUN09	2	0		3,298.40			IEM	//TB =40hr ;		
	Subtotal				637	01MAY07	13NOV09		718		5,745,510.07						

Activity ID	MILE- stones (level 2 & 3)	Activity Description	Duration (work days	Baseline Start	Baseline Finish	Shifts	Total % Float cmp	Proposed t Budgeted	FY07 FY08 FY09 FY10 FY11 FY12
		eriod Assy -Station 5-VIOLA		'					
Setup/Prepara	tions/G	eneral							
R1810-5101		MTM NCR hardware re-purchase	25	01JUL08*	05AUG08	1	42	54,936.00	□ 41=42\$k ;
R1810-5102		Monuments,reflectors,CCR's	10	01JUL08*	15JUL08	1	47	67,689.00	41=51.75\$k;
R1810-5103		metrology network in NCSX TC	10	16JUL08	29JUL08	1	47	21,973.60	I EM//TB =160hr ; 41=07\$k ;
R1810-5104		Misc for tooling	10	25AUG08*	08SEP08	1	42	0.00	
R1810-5112		Weld wire & welding supplies	25	01JUL08*	05AUG08	1	42	19,620.00	■ 41=15\$k ;
R1810-5106		Testout Sta 5 equipt & procedures	5	06AUG08	12AUG08	1	42	12,817.60	■ EM/TB =160hr;
R1810-5107		Check 3 sled interfaces adjust holes	12	13AUG08	28AUG08	1	42	30,762.24	■EM//TB =384hr;
R1810-5108		Fixtures installed-final metrology	6	29AUG08	08SEP08	1	42	15,381.12	I EM//TB =192hr ;
Station 5- Fina	I FP As	sy -FP#1 (in NCSX TC)							
		I			T				
R1810-5109		Begin Station 5 Operations	0		29OCT08	1	5	0.00	Maria de la Maria de la Maria de la Maria de la Maria de la Maria de la Maria de la Maria de la Maria de la Ma
S51-1.01		cut off short dome	2	30OCT08	31OCT08	1	5	3,298.40	EM/TB =40hr ;
S51-1.02		Install insulation system around all ports.	0	03NOV08	31OCT08	1	5	0.00	EM//TB =00hr ;
S51-1.03		Install heat tape and theomocouples on all ports	0	03NOV08	31OCT08	1	5	0.00	IEM/TB =00hr ;
S51-2.01		Install period support fixture	2	03NOV08	04NOV08	1	5	3,298.40	
S51-2.02		Install FPA on support stand.	2	05NOV08	06NOV08	1	5	3,298.40	EM//TB =40hr ;
S51-2.03		Install external working platforms	4	07NOV08	12NOV08	1	5	6,596.80	EM//TB =80hr ;
S51-2.04		Install internal VV working platforms	3	13NOV08	17NOV08	1	5	4,947.60	IEM//TB =60hr ;
S51-3.01		Install the domes (left and right side),	2	18NOV08	19NOV08	1	5	3,298.40	EM//TB =40hr ;
S51-3.02		Install small dome ports remaining circ ports.	30	20NOV08	13JAN09	1	5	49,476.00	□ EM//TB =600hr ;
S51-3.03		Leak check each port after it is welded.	30	15DEC08	03FEB09	1	5	49,476.00	EM //TB =600hr ;
S51-4.01		Install boots on ports except for the two port	16	23JAN09	13FEB09	1	5	26,387.20	■EM//TB =320hr ;
S51-5.01		Install MC lead connections to MC's (in job 7503	0	16FEB09	13FEB09	1	5	0.00	
S51-5.02		Install MC coolant lines on each MC	6	16FEB09	23FEB09	2	5	19,790.40	■EM//TB =240hr ;
S51-5.03		Platforms may need to be altered	2	24FEB09	25FEB09	2	5	4,947.60	IEM//TB =60hr ;
S51-6.01		Rotate 2 TF coils over the MC on the right side	1	26FEB09	26FEB09	2	5	3,298.40	IEM//TB =40hr ;
S51-6.02		Attach the temp support at end of Type-C MC	1	27FEB09	27FEB09	2	5	1,649.20	IEM//TB =20hr ;
S51-6.03		Lower leveler pad disengage base of MC right sid	0	02MAR09	27FEB09	2	5	0.00	IEM//TB =00hr ;
S51-6.04		Install TF support brackets	1	02MAR09	02MAR09	2	5	3,298.40	
S51-6.05		Secure First TF assy	1	03MAR09	03MAR09	2	5	1,649.20	
S51-6.06		Install TF support brackets	1	04MAR09	04MAR09	2	5	3,298.40	EM//TB
S51-6.07		Secure 2nd TF coil	1	05MAR09	05MAR09	2	5	1,649.20	EM//TB =20hr ;
S51-6.08		Install machine support plates	1	06MAR09	06MAR09	2	5	4,947.60	EM//TB =60hr ;
S51-6.09		Reinstall leveler pad	0	09MAR09	06MAR09	2	5	0.00	
S51-6.1		Installed one side of the TF support brackets	1 -	09MAR09	09MAR09	2	5	1,649.20	EM//TB =20hr ;
S51-7.01		The TF installation on the left side	7	10MAR09	18MAR09	2	5	21,439.60	■ EM//TB =260hr ;
Run Date		IUL07 07:31 ems, Inc.	ETCZ		CSX Project e Loaded Sch EAC	edule	Sheet 50 of 9	9	

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
S51-8.01	,	up check of the four TF coils	2	19MAR09	20MAR09	2	5		8,246.00			lEN	///TB =	:100hr ;			
S51-9.01	Tack weld the	left and right port 4's.	1	23MAR09	23MAR09	2	5		3,298.40			len	и//тв =	=40hr ;			
S51-9.02	Install boots	on both port 4's.	2	24MAR09	25MAR09	2	5		6,596.80			len	и//тв =	=80hr ;			
S51-10.01	Install PF coi	I support structure	4	26MAR09	31MAR09	2	5		13,193.60			len	и//TB =	=160hr ;			
S51-11.01	Install tMC co	olant manifold	2	01APR09	02APR09	2	5		4,947.60			ler	M//TB =	=60hr ;			
S51-11.02	Connect MC	coolant lines to the manifold	10	03APR09	16APR09	2	5		32,984.00			le	M//TB	=400hr ;			
S51-12.01	Install Rogow	ski coils	3	17APR09	21APR09	2	5		8,246.00			le	M//TB	=100hr ;			
S51-13.01	Obtain set of	Period 1 align fiducial positions	2	22APR09	23APR09	2	5		0.00			le	M//TB	=00hr ; 2	MET =10	00 ;	
S51-13.02	align to toolir	ng balls on each MCHP	1	24APR09	24APR09	2	5		0.00			le	M//TB	=00hr ; 2	MET =2	0 ;	
S51-13.03	bring the VV	into proper alignment	2	27APR09	28APR09	2	5		6,596.80			le	M//TB	=80hr ;			
S51-13.04	Install or iden	tify three primary fiducials	1	29APR09	29APR09	2	5		3,298.40			le	M//TB	=40hr ;			
S51-13.05	Make a final n	neasurement of all fiducials	2	30APR09	01MAY09	2	5		0.00			le	EM//TB	=00hr ; 2	ZMET =1	00 ;	
S51-13.11	Check Assem	bly (bolts, etc)	3	04MAY09	06MAY09	2	5		8,246.00			le le	EM//TB	=100hr			
S51-13.12	Check Diagno	ostics (Loops, thermocouples)	2	07MAY09	08MAY09	2	5		8,246.00			le	EM//TB	=100hr	;		
S51-13.13	Check manifo	olds (pressure, flow, etc.)	3	11MAY09	13MAY09	2	5		8,246.00			le	ЕМ//ТВ	=100hr			
S51-13.14	Check 6 mode	coils (voltage etc)	3	14MAY09	18MAY09	2	5		9,895.20			1	EM//TB	=120hr	;		
S51-13.15	Check trim co	oils (voltage etc)	2	19MAY09	20MAY09	2	5		4,947.60			1	EM//TB	=60hr ;			
S51-13.16	Check TF coil	s (voltage etc)	3	21MAY09	26MAY09	2	5		9,895.20			1	EM//TB	=120hr	,		
S51-14.01	Install crane r	igging to completed Period assy	1	27MAY09	27MAY09	2	5		3,298.40			ı	EM//TB	=40hr ;			
S51-14.02	Remove platf	orms	1	28MAY09	28MAY09	2	5		1,649.20			l l	Ем//ТВ	=20hr ;			
S51-14.03	2 Transfer Perio	od 1 to Station 6 in NCSX tTC.	1	29MAY09	29MAY09	2	5		3,298.40				Ем//тв	=40hr ;			
Station 5- Fina	I FP Assy -FP#2 (in N	ICSX TC)															
S52-1.01	cut off short of	dome	2	12MAR09	13MAR09	1	9		3,298.40			IEM	1//TB =	40hr ;			
S52-1.02	Install insulat	ion system around all ports.	0	16MAR09	13MAR09	1	9		0.00			IEM	1//TB =	00hr ;			
S52-1.03	Install heat ta	pe and theomocouples on all ports	0	16MAR09	13MAR09	1	9		0.00			IEM	1//TB =	00hr ;			
S52-2.01	Install period	support fixture	2	16MAR09	17MAR09	1	9		3,298.40			IEN	//TB =	40hr ;			
S52-2.02	Install FPA or	support stand.	2	18MAR09	19MAR09	1	9		3,298.40			lev	///TB =	:40hr ;			
S52-2.03	Install externa	al working platforms	4	20MAR09	25MAR09	1	9		6,596.80			lev	<i>И</i> //ТВ =	=80hr ;			
S52-2.04	Install interna	I VV working platforms	3	26MAR09	30MAR09	1	9		4,947.60			lev	и//TB =	=60hr ;			
S52-3.01	Install the dor	nes (left and right side),	2	31MAR09	01APR09	1	9		3,298.40			len	и//тв =	=40hr ;			
S52-3.02	Install small o	lome ports remaining circ ports.	30	02APR09	13MAY09	1	9		49,476.00				ЕМ//ТВ	=600hr	:		
S52-3.03	Leak check ea	ach port after it is welded.	30	23APR09	04JUN09	1	9		49,476.00]ЕМ//ТВ	=600hr	;		
S52-4.01	Install boots	on ports except for the two port	16	26MAY09	16JUN09	1	9		26,387.20			[В ЕМ//ТЕ	3 =320hr	;		
S52-5.01	Install MC lead	d connections on each of the MC's	1	17JUN09	17JUN09	2	9		0.00				IEM//TE	3 =00hr	;		
S52-5.02	Install MC cod	plant lines on each MC	6	18JUN09	25JUN09	2	9		19,790.40				IEM//TI	3 =240hr	;		
S52-5.03	Platforms ma	y need to be altered	1	26JUN09	26JUN09	2	9		4,947.60				IEM//TI	B =60hr	;		
S52-6.01	Rotate 2 TF co	oils over the MC on the right side	1	29JUN09	29JUN09	2	9		3,298.40				IEM//TI	B =40hr	,		
S52-6.02	Attach the ten	np support at end of Type-C MC	1	30JUN09	30JUN09	2	9		1,649.20				IEM//T	B =20hr	;		
un Date	18JUL07 07:3	1	ETCZ		CSX Project e Loaded Sch	edulo	Sheet 5	1 of 99	•								

Activity	MILE-	Activity		Baseline	Baseline	Shifts	Total	%	Proposed											
ID	stones (level 2	Description	(work days	Start	Finish		Float	cmplt	Budgeted	FY07	FY	08	F	Y09	FY1	0	FY1	11	FY.	12
III	& 3)															Ш	ШШ	ШШ	ШШ	Ш
S52-6.03	Lower leveler	pad disengage base of MC right sid	0	01JUL09	30JUN09	2	9		0.00					IEM/	/TB =0	Ohr ;				
S52-6.04	Install TF sup		1	01JUL09	01JUL09	2	9		3,298.40					IEM/	/TB =4	Ohr ;				
S52-6.05	Secure First T	Fassy	1	02JUL09	02JUL09	2	9		1,649.20					IEM/	/TB =2	Ohr ;				
S52-6.06	Install TF sup	port brackets	1	06JUL09	06JUL09	2	9		3,298.40					IEM/	//TB =4	Ohr ;				
S52-6.07	Secure 2nd T	= coil	1	07JUL09	07JUL09	2	9		1,649.20					lem/	//TB =2	.0hr ;				
S52-6.08	Install machin	e support plates	2	08JUL09	09JUL09	2	9		4,947.60					lem/	//TB =6	Ohr ;				
S52-6.09	Reinstall leve	er pad	0	10JUL09	09JUL09	2	9		0.00					IEM/	//TB =0	00hr ;				
S52-6.1	Installed one	side of the TF support brackets	1	10JUL09	10JUL09	2	9		1,649.20					lem/	//TB =2	20hr ;				
S52-7.01	The TF install	ation on the left side	6	13JUL09	20JUL09	2	9		21,439.60					IЕМ	//TB =2	260hr	;			
S52-8.01	Perform a fit-	ip check of the four TF coils	3	21JUL09	23JUL09	2	9		8,246.00					IEM	I//TB =	100hr	;			
S52-9.01	Tack weld the	left and right port 4's.	1	24JUL09	24JUL09	2	9		3,298.40					lew	1//TB =	40hr ;				
S52-9.02	Install boots	on both port 4's.	2	27JUL09	28JUL09	2	9		6,596.80					lev	1//TB =	80hr ;	;			
S52-10.01	Install PF coi	support structure	4	29JUL09	03AUG09	2	9		13,193.60					IEN	///TB =	160hr	;			
S52-11.01	Install tMC co	olant manifold	2	04AUG09	05AUG09	2	9		4,947.60					len	///TB =	60hr	;			
S52-11.02	Connect MC	coolant lines to the manifold	10	06AUG09	19AUG09	2	9		32,984.00					DE	W//TB =	=400hr	;			
S52-12.01	Install Rogow	ski coils	3	20AUG09	24AUG09	2	9		8,246.00					ler	M//TB =	=100hr	. ;			
S21-9.01	Install trim co	il and supports	3	25AUG09	27AUG09	2	9		9,895.20					le	M//TB :	=120hr	r ;			
S52-13.01	Obtain set of	Period 1 align fiducial positions	2	28AUG09	31AUG09	2	9		0.00					ΙE	M//TB	=00hr	; ZMET	T =10	00 ;	
S52-13.02	align to toolir	ng balls on each MCHP	1	01SEP09	01SEP09	2	9		0.00					lĘ	M//TB	=00hr	; ZMET	T =20) ;	
S52-13.03	bring the VV	into proper alignment	2	02SEP09	03SEP09	2	9		6,596.80					le	M//TB	=80hr	;			
S52-13.04	Install or iden	tify three primary fiducials	1	04SEP09	04SEP09	2	9		3,298.40					l∈	M//TB	=40hr	;			
S52-13.05	Make a final n	neasurement of all fiducials	2	08SEP09	09SEP09	2	9		0.00					le	M//TB	=00hr	; ZMET	T =10	00 ;	
S52-13.11	Check Assem	bly (bolts, etc)	3	10SEP09	14SEP09	2	9		8,246.00					IE	М//ТВ	=100h	ar ;			
S52-13.12	Check Diagno	estics (Loops, thermocouples)	2	15SEP09	16SEP09	2	9		8,246.00					le	M//TB	=100h	ır ;			
S52-13.13	Check manifo	lds (pressure, flow, etc.)	3	17SEP09	21SEP09	2	9		8,246.00					le le	EM//TB	=100h	nr ;			
S52-13.14		coils (voltage etc)	3	22SEP09	24SEP09	2	9		9,895.20					le	EM//TB	=120h	nr:			
S52-13.15		ils (voltage etc)	2	25SEP09	28SEP09	2	9		4,947.60					1						
S52-13.16		s (voltage etc)	2	29SEP09	30SEP09	2	9		9,895.20								hr :			
S52-14.01	Install crane r	igging to completed Period assy	1	01OCT09	01OCT09	2	9		3,410.40						EM//TB					
S52-14.02	Remove platf		1	02OCT09	02OCT09	2	9		1,705.20						EM//TB					
S52-14.03		od 2 to Station 6 in NCSX tTC.	1	05OCT09	05OCT09	2	9		3,410.40						EM//TB					
Ц	Il FP Assy -FP#3 (in N			0000.00	1000.00				6, 116.116						LIVII, 1 D					+
S53-1.01	cut off short of	lome	1	09JUN09	09JUN09	2	0		3,298.40					lem//	TB =40)hr ;				
S53-1.02	Install insulat	on system around all ports.	0	10JUN09	09JUN09	2	0		0.00					IEM//	TB =00)hr ;				
S53-1.03	Install heat ta	pe and theomocouples on all ports	0	10JUN09	09JUN09	2	0		0.00					IEM//	TB =00)hr ;				
S53-2.01	Install period	support fixture	1	10JUN09	10JUN09	2	0		3,298.40					IEM//	TB =40)hr ;				
S53-2.02	Install FPA or	support stand.	1	11JUN09	11JUN09	2	0		3,298.40					IEM//	TB =40)hr ;				
S53-2.03	Install externa	ıl working platforms	2	12JUN09	15JUN09	2	0		6,596.80					Іем//	TB =80)hr ;				
) D. (40 1111 07 07 0	4	ETCZ	N/	CSX Project		Sheet 5	2 of 99												
Run Date	18JUL07 07:3	1			e Loaded Sch	edule	31.000 0	_ 0. 55												
© Primave	era Systems, Inc.				EAC															

	MILE- Activity	Duration	Baseline Start	Baseline	Shifts	Total %	Proposed									
ID	stones Description (level 2	(work days		Finish		Float cmplt	Budgeted	FY07 FY08 FY09 FY10 FY11								
553-2.04	& 3)	2	16JUN09	17JUN09	2	0	4,947.60	LEMATED COL.								
53-2.04	Install internal VV working platforms Install the domes (left and right side),	1	18JUN09	1730N09 18JUN09	2	0	3,298.40	IEM/TB =60hr;								
553-3.01	Install small dome ports remaining circ ports.	15	19JUN09	10JUL09	2	0	49,476.00	IEM/TB =40hr ;								
553-3.02 553-3.03		15	30JUN09	21JUL09	2	0	49,476.00	EM/TB =600hr ;								
	Leak check each port after it is welded.					0	·	EM/TB =600hr;								
553-4.01	Install boots on ports except for the two port	8	16JUL09	27JUL09	2		26,387.20	■EM//TB =320hr ;								
53-5.01	Install MC lead connections on each of the MC's	1	28JUL09	28JUL09	2	0	0.00	IEM//TB =00hr ;								
53-5.02	Install MC coolant lines on each MC	6	29JUL09	05AUG09	2	0	19,790.40									
53-5.03	Platforms may need to be altered	2	06AUG09	07AUG09	2	0	4,947.60	EM//TB =60hr ;								
53-6.01	Rotate 2 TF coils over the MC on the right side	1	10AUG09	10AUG09	2	0	3,298.40									
53-6.02	Attach the temp support at end of Type-C MC	1	11AUG09	11AUG09	2	0	1,649.20	EM//TB =20hr ;								
53-6.03	Lower leveler pad disengage base of MC right sid	0	12AUG09	11AUG09	2	0	0.00	IEM//TB =00hr ;								
53-6.04	Install TF support brackets	1	12AUG09	12AUG09	2	0	3,298.40	EM//TB								
553-6.05	Secure First TF assy	1	13AUG09	13AUG09	2	0	1,649.20	EM//TB =20hr ;								
553-6.06	Install TF support brackets	1	14AUG09	14AUG09	2	0	3,298.40	I EM//TB =40hr ;								
553-6.07	Secure 2nd TF coil	1	17AUG09	17AUG09	2	0	1,649.20	EM//TB =20hr ;								
53-6.08	Install machine support plates	1	18AUG09	18AUG09	2	0	4,947.60	EM//TB =60hr ;								
53-6.09	Reinstall leveler pad	0	19AUG09	18AUG09	2	0	0.00	IEM/TB =00hr ;								
53-6.1	Installed one side of the TF support brackets	1	19AUG09	19AUG09	2	0	1,649.20	I EM//TB =20hr ;								
53-7.01	The TF installation on the left side	6	20AUG09	27AUG09	2	0	21,439.60	I EM//TB =260hr ;								
53-8.01	Perform a fit-up check of the four TF coils	3	28AUG09	01SEP09	2	0	8,246.00	I EM//TB =100hr ;								
53-9.01	Tack weld the left and right port 4's.	1	02SEP09	02SEP09	2	0	3,298.40	lEM//TB =40hr ;								
53-9.02	Install boots on both port 4's.	2	03SEP09	04SEP09	2	0	6,596.80	lEM//TB =80hr ;								
53-10.01	Install PF coil support structure	4	08SEP09	11SEP09	2	0	13,193.60	IEM//TB =160hr ;								
53-11.01	Install tMC coolant manifold	2	14SEP09	15SEP09	2	0	4,947.60	EM//TB =60hr ;								
553-11.02	Connect MC coolant lines to the manifold	10	16SEP09	29SEP09	2	0	32,984.00	EM//TB =400hr ;								
53-12.01	Install Rogowski coils	3	30SEP09	02OCT09	2	0	8,432.67	EM//TB =100hr ;								
22-9.01	Install trim coil	3	05OCT09	07OCT09	2	0	10,231.20	IEM//TB =120hr ;								
53-13.01	Obtain set of Period 1 align fiducial positions	2	08OCT09	09OCT09	2	0	0.00	IEM//TB =00hr ; ZMET =100								
53-13.02	align to tooling balls on each MCHP	1	12OCT09	12OCT09	2	0	0.00	EM//TB =00hr ; ZMET =20								
53-13.03	bring the VV into proper alignment	2	13OCT09	14OCT09	2	0	6,820.80	IEM//TB =80hr ;								
553-13.04	Install or identify three primary fiducials	1	15OCT09	15OCT09	2	0	3,410.40	EM//TB =40hr ;								
553-13.05	Make a final measurement of all fiducials	3	16OCT09	20OCT09	2	0	0.00	IEM//TB =00hr ; ZMET =100								
553-13.11	Check Assembly (bolts, etc)	2	21OCT09	22OCT09	2	0	8,526.00	EM//TB =100hr ;								
53-13.12	Check Diagnostics (Loops, thermocouples)	3	23OCT09	27OCT09	2	0	8,526.00	IEM//TB =100hr ;								
553-13.13	Check manifolds (pressure, flow, etc.)	2	28OCT09	29OCT09	2	0	8,526.00	EM//TB =100hr ;								
553-13.14	Check 6 modcoils (voltage etc)	3	30OCT09	03NOV09	2	0	10,231.20	 EM//TB =120hr ;								
553-13.15	Check trim coils (voltage etc)	2	04NOV09	05NOV09	2	0	5,115.60	 EM//TB =60hr ;								
553-13.16	Check TF coils (voltage etc)	3	06NOV09	10NOV09	2	0	10,231.20	I EM//TB =120hr ;								
	1	1	1	1		1 1										

	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
:	S53-14.01		Install crane rigging to completed Period assy	1	11NOV09	11NOV09	2	0		3,410.40				IEM//TB	=40hr ;	
3	S53-14.02		Remove platforms	1	12NOV09	12NOV09	2	0		1,705.20				ІЕМ//ТВ	=20hr ;	
3	S53-14.03		Transfer Period 3 to Station 6 in NCSX tTC.	1	13NOV09	13NOV09	2	0		3,410.40				ІЕМ//ТВ	=40hr ;	
	R1810-5333		Last field period assembled	0		13NOV09	2	0		0.00			,	lacksquare		
s	ubtotal			345	01JUL08	13NOV09		0		1,334,540.63			7			