				1									1	
	Number: 185													
	Title: Assembly of Field Periods													
1 doL	Numbers: 1802, 1810, and 1815													
	Fitle: FPA Oversight & Support (1802)													
JOD 1	File: FDA Overstiene Chatiene 4 0 8 2 (4040)													
	Fitle: FPA Operations - Stations 1, 2, & 3 (1810)													
Job 7	Fitle: FPA Operations - Station 5 (1815)													
Job I	Manager: Mike Viola													
	ation and Assembly													
Assum	ptions:													
	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													
<u> </u>	Parallel ops for sta 2			1/6				FTF						
\vdash			_	K\$.,		1 1	FTE						
l				, w	STRVL IOT	ORNL EM/DSN	-	4	_	~	>	rew		
1		Work	341	STK	STR TO		MEM	ASM	MSB	MTB	REW	Ö		
	TASK DESCRIPTION	days		37.8	35	SH EP OR	EN	E	EN	EN	క	Ψ̈́	Basis of Estimate	
1													Estimate based on recent NCSX FPA	
1													activities and the amount of oversight	
1													and supervision that is required,	
Job 180														
Oversi	ght & Supervision													checked with primavera
1													this is LOE adjust consistent with overall	
	Metrology Engineering Supervision Station 1 through station 5 raftopolous 50%						0.50						schedule	checked with primavera
1	DDD 511105016 44 4 6 5 15 16 4000						4.00						this is LOE adjust consistent with overall	and the second
<u> </u>	PPPL EM LOE Station 1 through station 5 Viola 100%					l l	1.00						schedule this is LOE adjust consistent with overall	checked with primavera
1													schedule. See table V for detail from	
1	Title III field period assembly Station 1 through station 5 ORNL support												Mike Cole	checked with primavera
—	This in hold period assembly "otation" i through station o ortive support	1 1	1	1 1		1		1		1			this is LOE adjust consistent with overall	checked with primavera
1	HP Coverage in the TFTR TC LOE Station 1 through station 3 @.75 fte					0.75							schedule	checked with primavera
	2-Modular Coil Sub- Assembly					0.75	il I							
						0.75							scriedule	
			_			0.75							scriedule	checked with primavera checked with primavera
<u> </u>	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204		7			0.75							Scredule	checked with primavera
	Sequence Plan (Brown) - Covered in Job 1803					0.78							suledule	checked with primavera checked with primavera
	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204	1.	1.0			0.78							scredule	checked with primavera checked with primavera checked with primavera
	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Elllis) - Covered in Job 8205		4.0			0.78							scredule	checked with primavera checked with primavera checked with primavera checked with primavera
	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Elliis) - Covered in Job 8205 Procedures written & approved					0.78							scredule	checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellilis) - Covered in Job 8205 Procedures written & approved JHA completed		5.0 5.0 2.0			0.78							scredule	checked with primavera
	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed		6.0 6.0			0.78							scredule	checked with primavera
	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellils) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational		5.0 5.0 2.0			0.78								checked with primavera checked with primavera checke
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly		5.0 5.0 2.0			0.78								checked with primavera checked with primavera checke
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803		5.0 5.0 2.0			0.78								checked with primavera checked with primavera checke
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204		5.0 5.0 2.0			0.78								checked with primavera checked with primavera
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803		3.0 3.0 2.0 1.0			0.78								checked with primavera checked with primavera checke
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204		3.0 3.0 2.0 1.0			0.78								checked with primavera checked with primavera
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205	11	3.0 3.0 2.0 1.0 0.0 3.0			0.78								checked with primavera checked with primavera
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures approved	11	3.0 3.0 2.0 1.0			0.78								checked with primavera checked with primavera
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Elliis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Elliis) - Covered in Job 8205 Procedures approved JHA completed	11	3.0 3.0 2.0 1.0 0.0 3.0			0.78								checked with primavera checked with primavera checke
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures approved JHA completed Training needs identified & released	11	3.0 3.0 2.0 1.0 0.0 3.0 3.0			0.78								checked with primavera checked with primavera checke
Station	Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures written & approved JHA completed Training needs identified & released ACC review completed Pre-job brief completed Station 2 operational 3-Modular Coil to VVSA Assembly Sequence Plan (Brown) - Covered in Job 1803 Systems Analysis (Brooks) - covered in Job 8204 Metrology Plan (Ellis) - Covered in Job 8205 Procedures approved JHA completed Training needs identified & released ACC review completed	11	3.0 5.0 2.0 1.0 0.0 6.0 5.0			0.78								checked with primavera checked with primavera checke

	 		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											
Fabrication 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											
Station 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
Job: 1802 - FP Assy Oversight&Support-VIOLA Total	\$ -	\$ -	\$ -	-	0	1 2	0	0	0		checked with primavera
											checked with primavera

WDS	Number: 185													
	Title: Assembly of Field Periods													
	lumbers: 1802, 1810, and 1815													
Job 1	itle: FPA Oversight & Support (1802)													
	itle: FPA Operations - Stations 1, 2, & 3 (1810)													
Job 1	itle: FPA Operations - Station 5 (1815)													
Job N	lanager: Mike Viola													
F-11	tion and Assembly													
Assum								1						
71000														
-	Assumes 5 day workweek 1 shift no overtime						1 1		ı					
	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													
-	raialiei ups iui sia z			K\$					FTE					checked with primavera
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		Work	2	STK	STRVL	<u>-</u> 1 ≥ 8	B	MEM	WSW.	4SB	ATB	غً إ		
	TASK DESCRIPTION	days	11MS	<u> </u>	SST	HOT JRNL	HTB	W.	SMS	SMS	IM	REW	Basis of Estimate	
Job:	1810 - Field Period Assembly-VIOLA		4			€ 1 ∪ µ	, o		щ	щ	щ			
OOD.	1010 TICIAT CHOA ASSCRIBIN VIOLA								1				Station 1: Based on actual VV #1	
													costs - almost completed.	checked with primavera
													Station 2: Based on actual VV #1	
													costs - almost completed.	checked 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
														checked with primavera
													Nose/Bushing related items based on conceptual designs and rough estimates	abooked with primayara
-													Assumed nose concept based on	checked with primavera
													application of epoxy & set-up times	checked with primavera
													estimates based on conceptual	
1													designs tempered with experieince in	
													alignment of multiple components	checked with primavera
Genera	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 primavera
											1.20		This is LOE adjust consistent with	and primarola
	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	
1	LOE Matrology gupport Clotion 4 through station 5.4.5 the appropriate due: - 4000/							4.50			4.00		schedule. Hours distributed per task based resource profile	aha aka durith primaye
-	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
	Misc M&S station 1 through station 5		3K/month										3K/month	checked with primavera
				K\$			1	r I	Hours					checked with primavera
		1	l						/ IOUI 3					onconda with primavera

WDO N 1 405		- 1	-						1	1	1					1
WBS Number: 185														\perp		
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:													-			
Assumes 5 day workweek 1 shift no overtime									,							
Parallel ops for sta 5 (2 fixtures available)																
Parallel ops for sta 5 (2 fixtures available)		T														
Only 1 fixture for station 3 only																
Parallel ops for sta 2																
		T			M.		Z		_					ew		
	W	Vork	41MS	T.K	STRVL	OT N	Q	8 8	NS NS	8		WITB	REW	ð		
TASK DESCRIPTION		ays	14	.S.1.S.	321		NE S		Ä	, i		M.	2	Vet	Basis of Estimate	checked with primavera
Station 1-FP #1 VV Prep (hard surface components)			<u> </u>			.,,										checked with primavera
Layout diagnostic&coolant paths on vessel - Completed		35.0								1			1			checked with primavera
Install heater tape on vertical ports - Completed		7.0														checked with primavera
Verify installation of heater tapes - Completed		1.0														checked with primavera
Attach studs for coolant lines - Completed		3.0														checked with primavera
Wind magnetic diagnostic sensors - Completed		14.0														checked with primavera
Install precision magnetic diagnostic sensors - Completed		3.0														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		2.0														checked with primavera
Install cooling/htg lines to vac vsl		15.0									3	300 2	1.5			checked with primavera
													_		asks alternating between FPA	
Weld cooling/htg risers		16.0	\$ 2.0K								3	320 2	.5		nt 2.5 men	checked with primavera
Verify Instl of H/C lines.headers.manifolds		5.0										100 2	.5		asks alternating between FPA nt 2.5 men	ate and an attended and an area
verify instit of H/C lines,neaders,manifolds		5.0									1	100 2	.5		asks alternating between FPA	checked with primavera
Perform final acceptance testing (H/C flow test)		5.0	\$ 4.0K									100	.5		nt 2.5 men	checked with primavera
renorm imal acceptance testing (n/c now test)		3.0	\$ 4.UK									100 2			asks alternating between FPA	checked with primavera
Trim seal plates		2.0										40	.5		nt 2.5 men	checked with primavera
Thin sour plates															asks alternating between FPA	onconca mar primavera
Loop termination & verification		18.0									3	360 2	.5		nt 2.5 men	checked with primavera
install Final Internal and External monuments and measure		4.0											1.5			checked with primavera
															asks alternating between FPA	
Final Scan		4.0										80 2	2.5		nt 2.5 men	checked with primavera
													T		asks alternating between FPA	
Install heater tape on removeable ports		10.0									2	200	.5		nt 2.5 men	checked with primavera
															asks alternating between FPA	
Prepare and transfer completed VV to holding are		2.0					1		1	1		40 2	.5	constar	nt 2.5 men	checked with primavera

WBS Number: 185				_						
WBS Title: Assembly of Field Periods					 	+				
					1					
Job Numbers: 1802, 1810, and 1815										
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Job Title: FPA Operations - Stations 1, 2, & 3 (1810)										
Job Title: FPA Operations - Station 5 (1815)										
Job Manager: Mike Viola										
Fabrication and Assembly										
Assumptions:										
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					1					
Parallel ops for sta 2					<u> </u>					
Station 1- FP #2 VV Prep (hrd surf cmpnts)		\$ 2	OK							checked with primavera
Misc Hardware - Completed Layout diagnostic&coolant paths on vessel - Completed		12.0	UN		1	1				checked with primavera
Install heater tape on vertical ports - Completed		7.0								checked with primavera
Verify installation of heater tapes - Completed		1.0								checked with primavera
Attach studs forcoolant lines - Completed		3.0	+							checked with primavera
Wind magnetic diagnostic sensors - Completed		14.0								checked with primavera
Install precision magnetic diagnostic sensors - Completed		3.0	+							checked with primavera
Verity 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								checked with primavera
										Serial tasks alternating between FPA
Install cooling/htg lines to vac vsl		15.0						300	2.5	constant 2.5 men. checked with primavera
										Serial tasks alternating between FPA
										constant 2.5 men. Delayed due to coil
Mald a display in a		400 0 0	01/					200	0.5	
Weld cooling/htg risers		16.0 \$ 2	UK					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	OK					100	2.5	constant 2.5 men checked with primayera
			UI .						2.5	
Trim seal plates		2.0						40	2.5	Serial tasks alternating between FPA
										constant 2.5 men. Need to buy high
										strength nibbler. checked with primavera
										Serial tasks alternating between FPA
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	checked with primavera
instali Final internal and External monuments and measure		4.0		_	1	-		00	2.5	
										Serial tasks alternating between FPA
Final Scan		4.0			<u></u>			80	2.5	constant 2.5 men checked with primavera
						1				Serial tasks alternating between FPA
Install heater tape on removeable ports		10.0						200	2.5	constant 2.5 men checked with primavera
The second secon	- + +				1					Serial tasks alternating between FPA
Prepare and transfer completed VV to holding are		2.0						40	2.5	
		2.01	1 1	1	11	1	1	40	2.5	constant 2.5 men checked with primavera
Frepare and transfer completed VV to floriding are				_						checked with primavera

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 Station and Assembly	checked with primavera checked with primavera checked with primavera
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 - Stations 5, 2, & 3 (1810) Job Manager: Mike Viola Fabrication 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 Station 1-FP #3 VV Prep (hrd surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 15% complete Serial tasks alternating between FPA Serial tasks alternating between	checked with primavera checked with primavera
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: 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 \$3 VV Prep (Ind surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 15% complete Serial tasks alternating between FPA constant 2.5 men. Not started yet due to	checked with primavera checked with primavera
Job Title: FPA Operations - Stations 1, 2, & 3 (1810) Job Title: FPA Operations - Station 5 (1815) Job Manager: Mike Viola Fabrication and Assembly Assumptions: Assumes 5 day workweek 1 shift no overtime Parallel ops for sta 5 (2 fixtures available) Separallel ops for sta 5 (2 fixtures available) Layout diagnostic&coolant paths on vessel - Completed 12.0 15% complete Serial tasks alternating between FPA Serial tasks alternating between FPA Constant 2.5 men. Not started yet duet	checked with primavera checked with primavera
Job Title: FPA Operations - Station 5 (1815) Job Manager: Mike Viola Fabrication and Assembly Assumptions: Assumptions: Assumes 5 day workweek 1 shift no overtime Parallel ops for sta 5 (2 fixtures available) Station 1-FP #3 W Prep (Ind surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 15% complete Serial tasks alternating between FPA constant 2 guest 2 fixed by the constant 2.5 men. Not started yet due to constant 2.5	checked with primavera checked with primavera
Job Manager: Mike Viola Fabrication 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 Station 1- FP #3 VV Prep (hrd surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 Assumes 5 day workweek 1 shift no overtime Parallel ops for sta 5 (2 fixtures available) Only 1 fixture for station 3 only Parallel ops for sta 2 Station 1- FP #3 VV Prep (hrd surf cmpnts) Misc Hardware S 2.0K Assumes 5 day workweek 1 shift no overtime Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 2 Station 1- FP #3 VV Prep (hrd surf cmpnts) Misc Hardware S 2.0K Assumes 5 day workweek 1 shift no overtime Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Double for station 3 only Parallel ops for sta 5 (2 fixtures available) Double for station 3 only Double for station 3 only Doub	checked with primavera checked with primavera
Fabrication 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 Station 1- FP #3 VV Prep (hrd surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 15% complete Serial tasks alternating between FPA constant 2.5 men. Not started yet due to	checked with primavera checked with primavera
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 #3 VV Prep (Ind surf cmpnts) Miss Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 Assumes 5 day workweek 1 shift no overtime Parallel ops for sta 5 (2 fixtures available) Double 1	checked with primavera checked with primavera
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 #3 VV Prep (Ind surf cmpnts) Miss Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 Assumes 5 day workweek 1 shift no overtime Parallel ops for sta 5 (2 fixtures available) Double 1	checked with primavera checked with primavera
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 #3 VV Prep (hrd surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 240 2.5 15% complete Serial tasks alternating between FPA constant 2.5 men. Not started yet due to	checked with primavera checked with primavera
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 #3 VV Prep (Ind surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 Serial tasks alternating between FPA constant 2.5 men. Not started yet due to	checked with primavera checked with primavera
Parallel ops for sta 5 (2 fixtures available) Only 1 fixture for station 3 only Parallel ops for sta 2 Station 1- FP #3 VV Prep (hrd surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 Serial tasks alternating between FPA constant 2.5 men. Not started yet due to	checked with primavera checked with primavera
Only 1 fixture for station 3 only Parallel ops for sta 2 Station 1- FP# 3V VP rep (hrd surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 Serial tasks alternating between FPA constant 2.5 men. Not started yet due to	checked with primavera checked with primavera
Parallel ops for sta 2 Station 1 - FP #3 VV Prep (Ind surf cmpnts) Misc Hardware Layout diagnostic&coolant paths on vessel - Completed 12.0 Serial tasks alternating between FPA constant 2.5 men. Not started yet due to	checked with primavera checked with primavera
Station 1- FP #3 VV Prep (hrd surf cmpnts) Misc Hardware \$ 2.0K	checked with primavera checked with primavera
Misc Hardware \$ 2.0K	checked with primavera checked with primavera
Layout diagnostic&coolant paths on vessel - Completed 12.0 240 2.5 15% complete Serial tasks alternating between FPA constant 2.5 men. Not started yet due t	checked with primavera
constant 2.5 men. Not started yet due t	
	2
	checked with primavera
Install heater tape on vertical ports 7.0 140 2.5 coil alignment tests Serial tasks alternating between FPA	_checked with phinavera
constant 2.5 men. Not started yet due t	
Verify installation of heater tapes 1.0 20 2.5 coil alignment tests	checked with primavera
Serial tasks alternating between FPA constant 2.5 men. Not started yet due t	0
Attach studs for coolant lines 3.0 60 2.5 coil alignment tests	checked with primavera
Serial tasks alternating between FPA	
Install Templates 3.0 constant 2.5 men. Not started yet due t)
Install rempites 5.0 Sorial tasks alternating between FPA	-
constant 2.5 men. Not started yet due t	
Wind magnetic diagnostic sensors 14.0 280 2.5 coil alignment tests Serial tasks alternating between FPA	checked with primavera
Install precision magnetic diagnostic sensors - Completed 3.0 Serial tasks attentioning between FFA	checked with primavera
Serial tasks alternating between FPA	
Verify installation magnetic diagnostic sensors - Completed 4.0 80 2.5 constant 2.5 men.	checked with primavera
Install local I&C (incl thermocouples) Serial tasks alternating between FPA 100 2.5 constant 2.5 men.	checked with primavera
Instantical recording year of the first including the first includ	Criecked with primavera
Verify installation of local I&C 2.0 40 2.5 constant 2.5 men.	checked with primavera
Install cooling/htg lines to vac vsl Serial tasks alternating between FPA 300 2.5 constant 2.5 men.	checked with primavera
Install cooling/ring lines to vac vsi	necked with primavera
constant 2.5 men Experience is 8 tubes	
per day 128 tubes per VVSA Serial tasks alternating between FPA	checked with primavera
Verify Inst! of H/C lines,headers,manifolds 5.0 Serial tasks attentioning between FFA constant 2.5 men.	checked with primavera
Serial tasks alternating between FPA	
Perform final acceptance testing (H/C flow test) 5.0 100 2.5 constant 2.5 men	checked with primavera
Trim seal plates 2.0 Serial tasks alternating between FPA constant 2.5 men	checked with primavera
11ml seal plates	checked with primavera
Serial tasks alternating between FPA	
Install Final Internal and External monuments and measure 4.0 80 2.5 constant 2.5 men. Serial tasks alternating between FPA	checked with primavera
Final Scan 4.0 Serial tasks atternating between FPA 80 2.5 constant 2.5 men.	checked with primavera
Serial tasks alternating between FPA	1
Install heater tape and insulation on removeable ports 10.0 200 2.5 constant 2.5 men	checked with primavera
Prepare and transfer completed VV to holding area 2.0 Serial tasks alternating between FPA 40 2.5 constant 2.5 men.	checked with primavera
Frepare and transfer completed vV to noting area 2.0 2.5	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

WDC	Number: 185							
	Title: Assembly of Field Periods							
Job N	Numbers: 1802, 1810, and 1815							
Job T	Fitle: FPA Oversight & Support (1802)							
	Title: FPA Operations - Stations 1, 2, & 3 (1810)							
	Title: FPA Operations - Station 5 (1815)							
Job N	Manager: Mike Viola							
Cobrida	ation and Assembly							
Assum								
Assum								
	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 Trials							checked with primavera
	Trial tensioning test on prototype		\$ 3.0K		40	2.5		checked with primavera
	Trial bushing and shim test on prototype	12.0			240	2.5		checked with primavera
	Perform trial x-y-z alignments on A1-A2. Perform developmental trials on A1-A2.		\$ 2.0K \$ 2.0K		140 600	2.5 2.5	included in job 1421	checked with primavera
	Bushing test A-B	7.0	\$ 2.0K		112	2.0	included in Job 1421	cnecked with primavera
	Bushing test R-D	7.0			112	2.0		
	Alignment mechanisms, metro equipt &positioning		\$ 40.0K		120	2.5		checked with primavera
	Procure alignment mechanisms, fiducials, lifting		\$ 25.0K		400	2.5		checked with primavera
	Develop procedures for torquing bolts	4.0			80	2.5		checked with primavera
							Perform welding trials and procure	
	Develop trails for for NOSE WELDING (RLS addition)		\$ 70.0K		600	2.5	EWI and Bob Parcells support	checked with primavera
	Determine fiducial types&locations	11.0			220	2.5		checked with primavera
	Procure monuments&related metrology equipment Hardware rework (1/2 FTE)	15.0 120.0			300 960	2.5 1.0	MISC LOE SUPPORT	checked with primavera checked with primavera
Station	2 Setup	120.0	\$ 10.0K		900	1.0	MISC ECE SOLI OKT	checked with primavera
	Misc Hardware		\$ 5.0K					checked with primavera
	Test out equipt & procedures	7.0	Ψ σ.σ.τ		140	2.5		checked with primavera
	Receive drawings and hardware (shims and bolts)	7.0			140	2.5		checked with primavera
	Shim sizing / preparations							checked with primavera
3.01	Using flange measurement of the coils, define the A/A and A/B shim thickness.						Back Office	checked with primavera
3.02	Surface grind a set of metal shims that will be used on the first MCHP article for assembly process qualifications.							
	qualifications.						Actual experience (LED: actual	
2.02	Compress allowing account of the and act to this leaves the abin act that will be in 1997 at 1	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.	6.0			120	2.5	800 shims - not critical path	checked with primavera
4.00	Pre-Installation Station 2 set-up							
							Metrology plan covering Station 2:	checked with primavera
4.01	Install MCHP fixtures and metrology equipment.						not critical path - separate crew in	
							parallel	checked with primavera
4.02	Perform metrology set-up and checks						not critical path - separate crew in	
l		5.0			100	2.5	parallel	checked with primavera
l	Install FIRST Holding 20 deg fixture		\$ 2.0K		80	2.5		checked with primavera
	Install SECOND Holding 20 deg fixture		\$ 2.0K		60	2.5	Just received - Not done yet	checked with primavera
	Install THIRD Holding 20 deg fixture		\$ 2.0K		120	2.5	Just received - Not done yet Just received - Not done yet	checked with primavera
	Install LAST Holding 20 deg fixture	3.0	\$ 2.0K		60	2.5	Just received - Not done yet	checked with primavera
	Tools&tooling available for FPA operations	2.0		 	40	2.5		checked with primavera
			1					checked with primavera

7/2/2007 12:51 PM

WBS	Number: 185										
WBS	Title: Assembly of Field Periods										
Job N	umbers: 1802, 1810, and 1815										
	itle: FPA Oversight & Support (1802)										
	itle: FPA Operations - Stations 1, 2, & 3 (1810)										
	itle: FPA Operations - Station 5 (1815)										
JOD IV	anager: Mike Viola										
Fabrica	tion and Assembly		1	l .							
Assum											
	Assumes 5 day workweek 1 shift no overtime		1	1	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										
STATIO	•										checked with primavera
	n 2 asauring and fitup checks										checked with primavera
	MC fit-up pre-check and surface insulation		1	1						Sequence Plan R5	checked with primavera
	Verify that mating MC's of a MCHP will come together without interferences by pre-fitting mating coils.									ooquonoo i ian ito	checked with philiavera
	This will include the Type-C coil with its interfacing Period Type-C coil.	4.0					80				checked with primavera
	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									2 at a time on the two 20 degree wedges	
2.01	Set the Type-A coil on the pre-measurement fixture, "A" side flange down.	1.0	1	1			20	2.5		May be done early	checked with primavera checked with primavera
2.02	Using the laser tracker, align to the conical seats locking into a minimum of 8 of them.	2.0	1				20	2.5	40	Metrology Staff Budgeted as LOE	checked with primavera
2.03	Establish a global coordinate system based on the modular coil geometry. Measure the monuments on	2.0									checked with philiavera
2.00	the fixture and on the walls.	7.0								Metrology Staff Budgeted as LOE	checked with primavera
	Measure all of the tooling ball monuments on the winding form.	1.0								Metrology Staff Budgeted as LOE	checked with primavera
2.05	Scan the "B" flange of the Type-A coil.	1.0								Metrology Staff Budgeted as LOE	checked with primavera
	Remove Type-A coil from stand and move to holding area.	1.0					20	2.5			checked with primavera
	Measure Type B "A" flanges	14.0					40	2.5		Repeats 2.01-2.07	checked with primavera
	Measure Type C "A"flanges	13.0					40	2.5		Repeats 2.01-2.07	checked with primavera
	Measure Type A-A "A" flange	13.0				_	40	2.5	220	Repeats 2.01-2.07	checked with primavera
	Shim sizing / preparations			ļ		-				Sequence Plan R5 Back Office	checked with primavera
3.01	Using flange measurement of the coils, define the A/A and A/B shim thickness.									васк Опісе	checked with primavera
3.02	Surface grind a set of metal shims that will be used on the first MCHP article for assembly process qualifications.	4.0					80	2.5		Actual experience	checked with primavera
4.00	Pre-Installation Station 2 set-up recalibration									Sequence Plan R5	checked with primavera
1.04	Install MCHP fixtures and metrology equipment.						0	2.5			checked with primavera
4.01											

West Full Care Assembly of Field Periods Obo Thirties: FAR Operating & Support (1922) Obo Thirties: FAR Operations - Station 5 (1815) Obo Thirties: FAR Operations - Station 5 (1815)	WBS	Number: 185												
John Number: 1902, 1910, and 1918														
Job Title: PR A potention s - Stations 1, 2, 3 (1810)														
Job Title: FPA Operations - Stations (1815)				1	+									
About Abou					+									
About Abou		1 , , , ,		1										
Assume				-	-									
Assume Side workeask shift no overtime Parallel spot for als 2 Fiftense worklash) Parallel spot for als 2 Fiftense worklash worklash and parallel spot for als 2 Fiftense worklash and parallel spot for all 2 Fiftense workla	JOD	nanager: wilke viola			1	1		1						
Assume Side workeask shift no overtime Parallel spot for als 2 Fiftense worklash) Parallel spot for als 2 Fiftense worklash worklash and parallel spot for als 2 Fiftense worklash and parallel spot for all 2 Fiftense workla				1										
Mary Parallel upon to take \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Fabric	ation and Assembly								1				
Persiding for the data of a first future available	Assun	ptions:												
Persiding for the data of a first future available		Assumes 5 day workweek 1 shift no overtime												
Particular of the fat \$6 C (Internal analyse)														
Part Filtre for state Part Pa		. , , , ,												
Assemble A142														
Second S														
1												_	<u></u>	
Marie Mari														checked with primavera
1	5.01	positions the Type-A modular coil on the fixture, "B" flange down. Obtain a set of "realigned" fiducial positions.	2.0							40				chacked with primayers
Second Second Secon	5.02	Align the laser tracker to the conical seats locking into a minimum of 8 of them.								40		20		ta di
Mary Continue and set the weak 19 19 19 19 19 19 19 1		Establish a global coordinate system based on the modular coil geometry. Measure the monuments on												
A fig page			2.0									40	Metrology Staff Budgeted as LOE	checked with primavera
10.5 20.0	5.04		0.5							10	2.5			checked with primavera
Search the recruments of the bottom coult, also as an excessing of being displaced or excessing of the bottom of the bottom coult, also as an excessing of being displaced or excessing of the bottom of the bottom coult, also as an excessing of the bottom		Install dial indicators on the modular coil in areas where we expect to see deflection.	2.0			L		<u> </u>		40	2.5			
Processing the set waters (Conf. of their corpus) growth of the 14 of 12 of 12 of 12 of 12 of 14 of 12 of 14 of 12 of 14 of			1.0							20	2.5			checked with primavera
decided with primaries and private larger private private plants present private priv	5.07		1.0							20	2.5			checked with primavera
solution for the management product allower solitors and purpose of contract and solitors and purpose of contract and purpose	5.08													
Land a hard "signife rest (protes on today) and affirms formate sure that they are ignif. If a boxes are than 1 and 1 an	5.09													
word bask of this sufficient adjacent tools to allow a replacement allowing to be invented. Tighten hot and such a support of the support of	5.10		2.0	1	1					40	2.5			checked with primavera
Store the Doorg Store and Store Control of Store	00	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and												
Control Cont	5 1 1		1.0	_			_			20	2.5			checked with primavera
Legislation of the control of the centred Fig pages. Evaluate shire pressure distribution and make chim adjournment of the pages of the control of the contr			5.0									100	Metrology Staff Budgeted as LOE	checked with primavera
checked with primaveral contents to enter the proper. Evaluate ability pressure distribution and make leave the analysis and the A Dozato to builty girl at the state obtained for use in re-positioning MCPP in Stags 3.	5.12		2.0							60	2.5			chacked with primayers
his impressure is unaccopatable. Re-bis comparison free-bis control primary and studies critical formation of the control withing primary and studies, russ, shims etc. Identify shim locations. 1.0 Remove all studes, russ, shims etc. Identify shim locations. 2.0 Remove all studes, russ, shims etc. Identify shim locations. 3.1 Remove all studes, russ, shims etc. Identify shim locations. 3.2 Remove all studes, russ, shims etc. Identify shim locations. 3.2 Remove all studes, russ, shims etc. Identify shim locations. 3.2 Remove all studes, russ, shims etc. Identify shim locations. 3.3 Remove all studes, russ, shims etc. Identify shim locations. 3.4 Remove all studes, russ, shims etc. Identify shim locations. 3.5 Remove all studes, russ, shims etc. Identify shim locations. 3.6 Remove all studes, russ, shims etc. Identify shim locations. 3.6 Remove all studes, russ, shims etc. Identify shim locations. 3.6 Remove all studes, russ, shims etc. Identify shim locations. 3.6 Remove all studes, russ, shims etc. Identify shims etc. Identify shims etc. 3.6 Remove all studes, russ, shims etc. Identify shims etc. 4.0 Remove the russ, shims etc. Identify shims etc. 4.0 Remove the russ, shims etc. Identify shims etc. 4.0 Remove the russ, shims etc. 4.0 Remo	5.13		3.0	-					-	60	2.5			
8.6.00 A Bemove all stude, rules, shims etc. Identify shim licentous. 9.00 A Part of Stude Coll assembly 9.01 Place the Type-A coll. A'f llarge down, on the 20deg feature. Obtain a set of "realigned" fiducial positions of the North A Total Licentary and Brooks. 9.02 Using the leave tracker, eligin to the content a seas bottem; man a minemum of a of them. 9.03 Start of Brooks. 9.04 Build Shim Bag with Foundation and a season storing man a minemum of a of them. 9.05 Start of Brooks. 9.05 Start of Brooks. 9.06 Start of Brooks. 9.06 Start of Brooks. 9.07 Start of Brooks. 9.08 Start of Brooks. 9.08 Start of Brooks. 9.09 Start of Brooks. 9.09 Start of Brooks. 9.00 Start o		shim pressure is unacceptable. Re-torque all studs to 50% and recheck alignment.			1									
A Bandular coil assembly of the "A" and "B" coils. A Bandular coil as														
Four the Type-A colt. "A" large down, on the 20deg foture. Obtain a set of "realigned" flucial positions for the "A" and "8" cols. A" and "8			1.0		+					20	2.5		Sequence Plan R5	
Jang the laser tracker, along to the control sease locking into a minimum of 6 of them. 20 Metrology Staff Budgeted as LOE checked with primavera the facture and on the walks. 20 40 Metrology Staff Budgeted as LOE checked with primavera the facture and on the walks. 20 40 ED. Staff Shim Bag with Fibergias, Reseal, Place Shim Bag on Wing 20 52 5 Checked with primavera the check of with primavera the cked wit		Place the Type-A coil, "A" flange down, on the 20deg fixture. Obtain a set of "realigned" fiducial positions											• • • • •	-
Easted the follower and on the weeks. 40 40 40 40 40 40 40 40	6.00									40	2.5	00	Motrology Stoff Budgeted as LOC	
He flature and on the walls. 6.04 Place the an initial set of metal shims on the coil in the designated locations. 5.04 Place the an initial set of metal shims on the coil in the designated locations. 5.05 Stuff Shim Bag with Fibergias, Reseal, Place Shim Bag on Wing 6.05 Lover the Type-B coil onto the Type-A coil. 6.06 Measure the monitoring of the Coil Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil. Just A greas of the coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil. Just A great of the Coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced monuments on the A coil as necessary to bring displaced on the Coil as necessary to bring displaced on the Coil as necessary to bring displ		Establish a global coordinate system based on the modular coil geometry. Measure the monuments on	1.0									20	Metrology Stall Budgeted as LOE	checked with primavera
Suff Shim Bag with Fiberglas, Reseal, Place Shim Bag on Wing 6.05 Cover the Type-B coil onto the Type-B coil ont												40	Metrology Staff Budgeted as LOE	
6.05 Lower the Type-B coll onto the Type-A coll. 6.06 Measure the monuments on the A coll. Jack areas of the coil as necessary to bring displaced monuments back to within 0.0° of their original position. 6.06 Install Dial indicators for X-Y Positioning 6.07 Using three target points on the B coil, perform the X-Y positioning of the B coil. 6.08 Install Dial indicators for X-Y Positioning 6.09 Wake a hand "wiggle" test (rotate on both) on all shims to make sure that they are tight. If a loose shim is found back off on sufficient adjacent boths to allow a replacement shim to be inserted. Tighten both and 10 or 10			2.0							40	2.5			checked with primavera
6.05 Lower the Type-B coil onto the Type-A coil. 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. 6.06 Install Dial Indicators for X-Y Positioning of the B coil. 6.07 Using three target points on the B coil perform the X-Y positioning of the B coil. 6.08 Install the remaining metal shims with Fuji paper, install studs, supernuts, and torque to 50% of final value. 6.09 Make a hand "wiggle" test (rotate on boil) on all shims to make sure that they are light. If a loose shim is found back off on sufficient adjacent boilts to allow a replacement shim to be inserted. Tighten boil and roll of original studs, adjust shims locally. Re-torque all studs to 50%. 6.10 Wessure the tooling balls on both coils. The maximum deviation from the Trail aloose shim is found back off on sufficient adjacent boilts to allow a replacement shim is coally. Re-torque all study to 50%. 6.10 Wessure the tooling balls on both coils. The maximum deviation from the Trail great points should be torque all study to 50%. 6.11 Make a hand "wiggle" test (rotate on boil to allow a replacement shim is found back off on sufficient adjacent boilts to allow a replacement shim is found back off on sufficient adjacent boilts to allow a replacement shim is found back off on sufficient adjacent boilts to allow a replacement shim to be inserted. Tighten boil and to the realigned points should be sufficient adjacent boilts to allow a replacement shim to be inserted. Tighten boil and the realigned points should be sufficient adjacent boilts to allow a replacement shim to be inserted. Tighten boil and the realigned points should be sufficient adjacent boilts to allow a replacement shim to be inserted. Tighten boil and the realigned points should be sufficient adjacent boilts. The maximum deviation from the "realigned points should be sufficient adjacent boilts to allow a replacement shim to be inserted. Tighten boil and the realigned points should be suffin	6.04.1	Stuff Shim Bag with Fiberglas, Reseal, Place Shim Bag on Wing	0.0								0.5			ab a also dissibly a view asset
Measure the monuments on the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the coil as necessary to bring displaced monuments and the A coil. Jack areas of the Checked with primavers and a coil as the A coil as the B coil. Jack areas of the Checked with primavers and a coil as the A coi	6.05	I ower the Type-B coil onto the Type-A coil.							1				assembly	
back to within, 002" of their original position. 1.0 20 2.5 6.06.1 Install Dial indicators for X-Y Positioning 6.07 Using three target points on the B coil, perform the X-Y positioning of the B coil. 6.08 Install the remaining metal shims with Fuji paper, install study, supernuts, and torque to 50% of final value. 6.09 Make a hand "wiggle" test (rotate on both) on all shims to make surer that they are tight. It a loose shim is found ask off on sufficient adjacent botts on allow a replacement shim to be inserted. Tighten bott and substa to 50%. 6.10 Massure the tooling balls on both coils. The maximum deviation from the "realigned" points should be 0.07" or less substa to 50%. 6.11 Loosen all study, reduce load on flanges and install an equivalent set of alumina coated metal shims. Retorque all study, so 50%. 6.12 Loosen all study, reduce load on flanges and install an equivalent set of alumina coated metal shims. Retorque all study is 50%. 6.13 Make a hand "wiggle" test (rotate on both) on all shims to make surer that they are tight. If a loose shim is found ask off on sufficient adjacent botts to allow a replacement shim to be inserted. Tighten bott and control study is 50%. 6.14 Massure the tooling balls on both coils. The maximum deviation from the "realigned" points should be 1.0 7.0 Loosen all study, reduce load on flanges and install an equivalent set of alumina coated metal shims. Retorque all study is 50%. 8.0 Loosen all study is 5		Measure the monuments on the A coil. Jack areas of the coil as necessary to bring displaced monuments		1	+									
6.07 Using three target points on the B coil, perform the X-Y positioning of the B coil. 6.08 Install the remaining metal shims with Fuji paper, install studs, supernus, and torque to 50% of final value. 6.09 Make a hand "wiggle" test (rotate on boil) on all shims to make sure that they are tight. If a loose shim is found back off on sufficient adjacent boils to allow a replacement shim to be inserted. Tighten boil and studies to 50%. 6.10 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be study to 50%. 6.11 If the above step does not fall within .007" or less then loosen all studs, adjust shims locally, Re-torque all studs to 50%. 6.12 Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Reformed back off on sufficient adjacent boils to allow a replacement shim to be inserted. Tighten boil and recheck. 6.13 Make a hand "wiggle" test (rotate on boil) on all shims to make sure that they are tight. If a loose shim is found back off on sufficient adjacent boils to allow a replacement shim to be inserted. Tighten boil and recheck. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be		back to within .002" of their original position.											I ED. Missing from	
6.08 Install the remaining metal shims with Fuji paper, install studs, supernuts, and torque to 50% of final value. 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 found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and recheck. 6.10 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be 3.007 or less. 6.11 If the above step does not fall within .007* or less then loosen all studs, adjust shims locally. Re-torque all studs to 50%. 6.12 Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Re-torque all studs to 50%. 6.12 Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Re-torque all studs to 50%. 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. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be considered. Tighten bolt and recheck. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be considered. Tighten bolt and recheck. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be considered. Tighten bolt and recheck.									1				LED: MISSING from sequence	
walue. Additional part of the properties of the				1	1				1					checked with primavera
found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and recheck. 6.10 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be 0.007" or less. 6.11 If the above step does not fall within .007" or less then loosen all study, adjust shims locally. Re-torque all studys to 50%. 6.12 Locar beat studys to 50%. 6.13 Locar all studys, reduce load on flanges and install an equivalent set of alumina coated metal shims. Re-torque all studys to 50%. 6.12 Locar all studys, reduce load on flanges and install an equivalent set of alumina coated metal shims. Re-torque all study in torque all study in solid widgel" 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. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be		value.	2.0							40	2.5			checked with primavera
recheck. 1.0 1.0 Metrology Staff Budgeted as LOE checked with primavera 1.0 Metrology Staff Budgeted as LOE checked with primavera checked with primavera checked with primavera 1.0 Metrology Staff Budgeted as LOE checked with primavera checked with primaver	6.09		1											
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6.11 If the above step does not fall within .007" or less then loosen all studs, adjust shims locally. Re-torque all studs to 50%. 6.12 Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Re-torque all studs to 50%. 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. 6.14 Measures the tooling balls on both coils. The maximum deviation from the "realigned" points should be	6.10		5.0									100	Metrology Staff Budgeted as LOF	checked with primavera
studs to 50%. 6.12 Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Relative load on flanges and install an equivalent set of alumina coated metal shims. Relative load to flanges and install an equivalent set of alumina coated metal shims. Relative load to 50%. 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. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	6.11											100	men clogy oftan badgeted de LOL	oncoxed with primavera
torque all studs to 50%. 6.13 Make a hand "wiggle" test (rotate on boit) on all shims to make sure that they are tight. If a loose shim is lound back off on sufficient adjacent boits to allow a replacement shim to be inserted. Tighten boit and recheck. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be		studs to 50%.	3.0							60	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. 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	6.12	Loosen all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Re- torque all studs to 50%.	1.0							20	2,5			checked with primavera
recheck. 1.0 1.0 2 20 2.5 Checked with primavera 6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	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	1.0							20	0			zazzatoa mar primavera
6.14 Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be			1 0							20	25			checked with primavera
6.0 Matralagy Staff Budgeted as LOC should always a	6.14	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	1.0					1	<u> </u>	20	د.ع			<mark>-</mark>
100 metrology Staff Budgeted as LOE Checked with primavera	<u></u>	.007" or less.	5.0									100	Metrology Staff Budgeted as LOE	checked with primavera

Job Numbe	: Assembly of Field Periods			1									
Job Numbe													
				-									
IJOD LITIE: F	ers: 1802, 1810, and 1815			-									
	FPA Oversight & Support (1802)	_											
	FPA Operations - Stations 1, 2, & 3 (1810)												
	FPA Operations - Station 5 (1815)												
Job Manag	ger: Mike Viola												
Fabrication an	nd Assembly			1	1	1	1		-				
Assumptions:													
Accur	mes 5 day workweek 1 shift no overtime			1		1							
	el ops for sta 5 (2 fixtures available)				1								
	el ops for sta 5 (2 fixtures available)												
	el ops for sta 5 (2 fixtures available) 1 fixture for station 3 only	-									-		
Paralle	el ops for sta 2	_				1							
6.15 If the ab	bove step does not fall within .007" or less then loosen all studs, adjust shims locally. Re-torque all	3.0							60	2.5			checked with primavera
studs to 6.16 One hole	le at a time, remove the supernut. Using the eccentric gage slid onto the stud define the hole	0.0			1				200			LED: Technical Issue space in some	checked with primavera
eccentric	icity. Select bushing and machine to match required eccentricity. Install bushing. Replace nut and								200			areas is insufficient to remove nuts	
other ta	back to 50% and recheck alignment. Total 10 days 7 days to pre fit & fab bushings (in parallel with isks) and 3 days to install											with flanges in position. If there is	
												space duration should be 1.5 days	ale a ale and codule and as a
6.17 Comple	ete tightening of flange bolts to 100%.	1.0							20	25			checked with primavera checked with primavera
6.18 Measure	re the tooling balls on both coils. The maximum deviation from the "realigned" points should be								20	2.0			
.007" or	r less. le "B" flange of Type-B coil	2.0								0.5	40	Metrology Staff Budgeted as LOE	checked with primavera
	the "B" flange of Type-B coil he "B" flange measurement of the Type-B coil and the earlier "A" flange measurement of the Type-I	1.0			-				20	2.5			checked with primavera
C coil, d	define all B/C flange shim thickness.				<u> </u>		<u></u>					Back office	checked with primavera
	o C modular coil assembly (MCHP)											Sequence Plan R5	checked with primavera
7.01 Place the	ne "A/B" assembly, "A" coil down, on the 40deg fixture. Obtain a set of "realigned" fiducial positions. "A", "B", and "C" coils.	3.0							60	2.5			checked with primavera
7.02 Using th	he laser tracker, align to the conical seats locking into a minimum of 8 of them.	1.0		<u> </u>		1					20	Metrology Staff Budgeted as LOE	checked with primavera
7.03 Establish	sh a global coordinate system based on the modular coil geometry. Measure the monuments on ure and on the walls.	2.0									40	Metrology Staff Budgeted as LOE	obooked with primayers
	the an initial set of metal shims on the coil in the designated locations.	2.0							40	2.5	40	metrology clair budgeted as LOE	checked with primavera checked with primavera
	he Type-C coil onto the Type-B coil.	1.0			1				20	2.5 2.5			checked with primavera
7.06 Measure	re the monuments on the A coil to evaluate monument displacements. If movement greater than						·						
	observed discuss with back office on how to proceed in bringing displaced monuments back to 002" of their original position.	1.0									20	Metrology Staff Budgeted as LOE	checked with primavera
	002* of their original position. Dial indicators for X-Y Positioning	1.0							20	0		LED: Missing from sequence	checked with primavera
	hree 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 th	he remaining metal shims with Fuji paper, install studs, supernuts, and torque to 50% of final	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 ba recheck.	eack off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and	1.0							20	2.5			checked with primavera
	re the tooling balls on all coils. The maximum deviation from the "realigned" points should be .010"			<u> </u>		1			23			Matralami Staff Budgets I as I 65	
or less. 7.11 If the ab	bove step does not fall within .010" or less then loosen all studs, adjust shims locally. Re-torque all	5.0									100	Metrology Staff Budgeted as LOE	checked with primavera
studs to	50%.	3.0		<u></u>	<u> </u>				60	2.5			checked with primavera
7.12 Loosen	all studs, reduce load on flanges and install an equivalent set of alumina coated metal shims. Reall studs to 50%.	1.0							20	2.5			checked with primavera
7.13 Make a l	hand "wiggle" test (rotate on bolt) on all shims to make sure that they are tight. If a loose shim is	1.0			1				20	2.0			oncoked with primavera
	ack off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and	1.0							20	2.5			checked with primavera
	ce the tooling balls on all coils. The maximum deviation from the "realigned" points should be .010"				+								
or less.		5.0			1				100	2.5			checked with primavera
7.15 If the ab	bove step does not fall within .010" or less then loosen all studs, adjust shims locally. Re-torque all b 50%.	3.0							60	2.5			checked with primavera
	le at a time, remove the supernut. Using the eccentric gage slid onto the stud define the hole icity. Select bushing and machine to match required eccentricity. Install bushing. Replace nut and				•	_	·	1					
eccentric tighten f	icity. Select bushing and machine to match required eccentricity. Install bushing. Replace nut and back to 50% and recheck alignment. Total 10 days 7 days to pre fit & fab bushings (in parallel with												
other tas	isks)and 3 days to install	0.0								2.5		LED: Increase duraction to 1.5	checked with primavera
	ete tightening of flange bolts to 100%.	1.0							20				checked with primavera
	or identify three primary fiducials that will be used in positioning the Period in Station 3. The the tooling balls on both coils. The maximum deviation from the "realigned" points should be	1.0		<u> </u>					20	2.5			checked with primavera
.010" or	r less. Make final metrology measurement of all fiducials. Scan the "B" flange of Type-C coil.	5.0									400	Matrology Staff Products I as I CF	all and and address
	the results. reld inboard welded shims	5.0									100	Metrology Staff Budgeted as LOE Sequence Plan R5	checked with primavera checked with primavera
and rubit me	y tack weld all inboard shims to one flange to keep them in place. The final welding of all welded											•	checked with primavera
shims to	o take place in Station 3.	2.0							40	2.5		Perform at A-B also	checked with primavera
9.00 Install to	trim coil				1							Sequence Plan R5	checked with primavera

										-	
VBS Number: 185											
VBS 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											
abrication 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											
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 Figure 3 below).		6.0						120	2.5		checked with primavera
10.00 Complete local service and interface details	+ +	0.0						120	2.0	Sequence Plan R5	checked with primavera
10.01 Install all wing support bladders between wing surfaces (A/B, B/C) and on the C wing (MCHP - Right Side			1								
only).		2.0						40	2.5	LED: Bags were placed earlier	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						160	2.5	gages terminations	checked with primavera
10.03 Inject 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
11.00 Final measurements / transfer completed MCHP to holding area				1	1					Sequence Plan R5	checked with primavera
11.02 Make final metrology measurement of all fiducials. Scan the "B" flange of Type-C coil. Record the results	i.							0	2.5	Done at 7.18	checked with primavera
11.03 Using tension tester measure bolt length on all tension fasteners and record the results.		0.5		 1				10	2.5	Done at 7.10	checked with primavera
11.04 Mark part for identification		0.0						0	2.5		checked with primavera
11.05 Install lift support beams		2.0						40	2.5		checked with primavera
11.06 Remove from stand and measure weight of completed assembly		1.0		1				20	2.5		checked with primavera
11.07 Move to holding area.		0.0		1	1			0	2.5	246 shifts	checked with primavera
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IMPC	Number: 185						
_	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
	Title: Assembly of Field Periods						
	lumbers: 1802, 1810, and 1815						
	itle: FPA Oversight & Support (1802)						
Job T	itle: FPA Operations - Stations 1, 2, & 3 (1810)						
Job T	itle: FPA Operations - Station 5 (1815)						
Job N	Manager: Mike Viola						
	ation and Assembly						
Assum	ptions:						
	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						
	A1,B1,C1 subtotal task 5-11 (total elasp time	126	5	2125	740		checked with primavera
	2 - Production Articles (HPA) and second half of FP #1 A2,B2,C2					Sequence Plan R5	checked with primavera
	MC fit-up pre-check and surface insulation		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. 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			2.5		checked with primavera
2.00	Pre-measurement of MCHP Type A, B and C coils flanges plus interfacing Type-A coil flange					Sequence Plan R5	
2.08	Measure Type B "A" flanges	14.0	1	40	2.5 220	Repeats 2.01-2.07	checked with primavera checked with primavera
	Measure Type C "A"flanges	13.0			2.5 220	Repeats 2.01-2.07	checked with primavera
	Measure Type A-A "A" flange	13.0			2.5 220	Repeats 2.01-2.07	checked with primavera
3.00	Shim sizing / preparations	10.0	1		LLO	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.			 		Managed and a second state of	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.	-+-			2.5	Sequence Flan K5	checked with primavera checked with primavera
4.02	Perform metrology set-up and checks 5	53.0 2.0)	0	40	Metrology Staff Budgeted as LOE	checked with primavera
5.00	Pre-assemble A-A (Needs to be done total of 3 timee A1-A2, A3-A4, A5-A6)		<u> </u>		40		checked with primavera
5.01	Position the Type-A modular coil on the fixture, "B" flange down. Obtain a set of "realigned" fiducial						
5.02	positions.	$\overline{}$					checked with primavera
5.02	Align the laser tracker to the conical seats locking into a minimum of 8 of them. Establish a global coordinate system based on the modular coil geometry. Mea						checked with primavera
5.05	the fixture and on the walls.						checked with primavera
5.04	Place all alumina and grind inboard weld shims on the coil.		\mathbb{R}^{-1}				checked with primavera
5.05	Install dial indicators on the modular coil in areas where we expect to see defle						
			1 /				checked with primavera
5.06	Lower the mating type A modular coil into position.		,				
5.06	Measure the monuments on the bottom coil. Jack areas of the coil as necessary displaced monuments back to within .002" of their original position.		`				checked with primavera
5.07 5.08	Measure the monuments on the bottom coil. Jack areas of the coil as necession displaced monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2						checked with primavera checked with primavera checked with primavera checked with primavera
5.07 5.08 5.09	Measure the monuments on the bottom coil. Jack areas of the coil as necessal displaced monuments back to within .002° of their original position. Using three target points, perform the positioning as was done in the A1-A2 II lineal install studs, supernuts, and torque to 50% of final value.						checked with primavera checked with primavera checked with primavera
5.07 5.08	Measure the monuments on the bottom coil. Jack areas of the coil as necession displaced monuments back to within .002° 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						checked with primavera checked with primavera checked with primavera checked with primavera
5.07 5.08 5.09	Measure the monuments on the bottom coil. Jack areas of the coil as necessal displaced monuments back to within .002° of their original position. Using three target points, perform the positioning as was done in the A1-A2 II lineal install studs, supernuts, and torque to 50% of final value.						checked with primavera checked with primavera checked with primavera checked with primavera
5.07 5.08 5.09	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to whith .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2! It lies to the study of the						checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
5.07 5.08 5.09 5.10 5.11	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .002° of their original position. Using three target points, perform the positioning as was done in the A1-A2 il line 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 recheck. Measure the tooling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils. The maximum deviation from the "final policy in the colling balls on both coils."			bove			checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .002° of their original position. Using three target points, perform the positioning as was done in the A1-A2 !! lists all 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 recheck. Measure the tooling balls on both coils. The maximum deviation from the "i should .007" 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%.			loove			checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .002° of their original position. Using three target points, perform the positioning as was done in the A1-A2. It lies 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 recheck. Measure the tooling balls on both coils. The maximum deviation from the "fi should off 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%. Install the A-A locator bushings at two stud locations for use in re-positioning MCHP in Stage 3.			Dove			checked with primavera checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14	Measure the monuments on the bottom coil. Jack areas of the coil as necession monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 I limb limb and the study of the street of the study of the street and the study of the street and study. Supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on boil) on all shims to make sure that the found back off on sufficient adjacent boils to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "found back of the street and the study of the street and study of the str			Bove		Samura Dia Pr	checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 II lies 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 "1" led" part of the bolt of the bolt of the study of the s			Bove		Sequence Plan R5	checked with primavera checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14	Measure the monuments on the bottom coil. Jack areas of the coil as necessing the coil as necessing to the coil as t	1.0			2.5	Sequence Plan R5	checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A2 II lies 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 "1" led" part of the bolt of the bolt of the study of the s	1.0			2.5	Sequence Plan R5 Metrology Staff Budgeted as LOE	checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01	Measure the monuments on the bottom coil. Jack areas of the coil as necessimonuments back to whithin .002" of their original position. Using three target points, perform the positioning as was done in the A1-A21 line 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 bolts to allow a replacement shim to be recheck. It the above step does not fall within .007" or less then loosen all studs, adjust 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.				20	Metrology Staff Budgeted as LOE	checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02 6.03	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to whith .002" of the bir original position. Using three target points, perform the positioning as was done in the A1-A2 I list listed study. 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 "I look of the bolt of the bo	1.0 2.0		20	20 40	Metrology Staff Budgeted as LOE	checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02 6.03	Measure the monuments on the bottom coil. Jack areas of the coil as necessimonuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A21 liss install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on boil) 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 "line" should .007" 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%. 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. Estatoish a global coordinate system based on the modular coil geometry. Measure the monuments on the fidure and on the walls. Place all alumina and grind inboard weld shims on the coil.				20 40	Metrology Staff Budgeted as LOE	checked with primavera
5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 6.00 6.01 6.02	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to whith .002" of the bir original position. Using three target points, perform the positioning as was done in the A1-A2 I list listed study. 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 "I look of the bolt of the bo	2.0 2.0		20	20 40 2.5	Metrology Staff Budgeted as LOE	checked with primavera
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	Measure the monuments on the bottom coil. Jack areas of the coil as necessimonuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A21 liss install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on boil) 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 "line" should .007" 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%. 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. Estatoish a global coordinate system based on the modular coil geometry. Measure the monuments on the fidure and on the walls. Place all alumina and grind inboard weld shims on the coil.	2.0 2.0 0.3		20	20 40 2.5	Metrology Staff Budgeted as LOE Metrology Staff Budgeted as LOE LED: Must place bag before coil	checked with primavera
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	Measure the monuments on the bottom coil. Jack areas of the coil as necess monuments back to whith .002" of the bir original position. Using three target points, perform the positioning as was done in the A1-A2! 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 boil) on all shims to make sure that the found back off on sufficient adjacent boits to allow a replacement shim to be recheck. Measure the tooling balls on both coils. The maximum deviation from the "for less. It the above step does not fall within .007" or less then loosen all studs, adjust 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 facular and on the walls. Place all alumina and grind inboard weld shims on the coil. Stuff Shim Bag with Fiberglas, Reseal, Place Shim Bag on Wing	2.0 2.0		20	20 40 2.5 2.5 2.5	Metrology Staff Budgeted as LOE Metrology Staff Budgeted as LOE LED: Must place bag before coil assembly	checked with primavera
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	Measure the monuments on the bottom coil. Jack areas of the coil as necessimonuments back to within .002" of their original position. Using three target points, perform the positioning as was done in the A1-A21 lias install studs, supernuts, and torque to 50% of final value. Make a hand "wiggle" test (rotate on boil) 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 "lined" particular bolts of 50%. Measure the tooling balls on both coils. The maximum deviation from the "lined" particular bolts of 50%. Measure the tooling balls on both coils. The maximum deviation from the "lined" particular bolts of 50%. Measure the tooling balls on both coils. The maximum deviation from the "lined" particular bolts of 50%. Measure the tooling balls on both coils. The maximum deviation from the "lined" particular bolts of 50%. Measure the tooling balls on both coils. The maximum deviation from the "lined" particular bolts of 50%. Measure the tooling balls on both coils. The maximum deviation from the "lined" particular bolts of 50%. Measure the tooling balls on both coils. The maximum deviation from the "lined" particular bolts of 50%. 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 alumina and grind inboard weld shims on the coil. Stuff Shim Bag with Fiberglas, Reseal, Place Shim Bag on Wing Lower the Type-B coil onto the Type-A coil.	2.0 2.0 0.3		20	20 40 2.5 2.5 2.5	Metrology Staff Budgeted as LOE Metrology Staff Budgeted as LOE LED: Must place bag before coil	checked with primavera

WDC	Number: 185									
	Title: Assembly of Field Periods								+	
	,									
	lumbers: 1802, 1810, and 1815									
	itle: FPA Oversight & Support (1802)									
	itle: FPA Operations - Stations 1, 2, & 3 (1810)									
Job 1	itle: FPA Operations - Station 5 (1815)									
Job N	Manager: Mike Viola									
F-11	dan and Assembly									
	tion and Assembly ptions:									
- 1004										
	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									
6.07	Parallel ops for sta 2 Using three target points on the B coil, perform the X-Y positioning of the B coil.	1.0		1				20	Metrology Staff Budgeted as LOE	checked with primavera
6.08	Install studs, supernuts, and torque to 50% of final value.	2.0				40	2.5		mon original Dadgotta as EUE	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	1		-10	0			
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and	1.0				20	2.5			checked with primavera
6.10	recheck. Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	1.0		1		20	∠.5			checked with primavera
	.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 studs to 50%.	3.0				60	2.5			checked with primavera
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		1		60	∠.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	10.0				200	2.5		LED: See above	checked with primavera
6.13	other tasks)and 3 days to install Complete tightening of flange bolts to 100%.	1.0		1		20	2.5		223.000 00010	checked with primavera
6.14	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be					20	2.0		Materials and Otal Device According	
0.45	.007" or less.	3.0					0.5	60	Metrology Staff Budgeted as LOE	checked with primavera
6.15 6.16	Scan the "B" flange of Type-B coil	1.0	1			20	2.5			checked with primavera
0.10	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		1		40	2.5	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	1.0						- 20		
	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	2.5			checked with primavera
7.05	Lower the Type-C coil onto the Type-B coil.	1.0		1		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	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					2.5			checked with primavera
7.08	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	1			40	2.5			checked with primavera
7.05	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and									
7.10	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									
L	other tasks)and 3 days to install	10.0					2.5		LED: See above	checked with primavera
7.12	Complete tightening of flange bolts to 100%.	1.0				20	2.5			checked with primavera
7.13	Measure the tooling balls on both coils. The maximum deviation from the "realigned" points should be	4.0						80	Metrology Staff Budgeted as LOE	checked with primavera
8.00	Tack weld inboard welded shims	4.0						- 00	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		1	1					• • • • • • •	
	shims to take place in Station 3.	1.0	1			20	2.5		C	checked with primavera
9.00	Install trim coil								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 Figure 3 below).	6.0				120	2.5			checked with primavera
10.00	Complete local service and interface details	0.0	1			120			Sequence Plan R5	checked with primavera
10.01	Inflate all wing support bladders between wing surfaces (A/B, B/C) and on the C wing (MCHP - Right Side						0.5		Soo abovo	
10.02	only). Make local service runs/connections on the shell of each MC.	2.0				40	2.5		See above 4 days for coolant lines 4 days for	checked with primavera
10.02	INIANC IOCAI SCIVICE TURIS/COMMECTIONS ON THE SHEILOF EACH MIC.								mod coils thermocouples and strain	
1		8.0				160	2.5		gages terminations	checked with primavera
<u> </u>		0.0	11	1		100	2.0		J.J	onconsa with primavera

			,								
WBS	Number: 185										
WBS	Title: Assembly of Field Periods										
Job N	Numbers: 1802, 1810, and 1815										
	Fitle: FPA Oversight & Support (1802)										
Job 1	Title: FPA Operations - Stations 1, 2, & 3 (1810)										
Job 1	Title: FPA Operations - Station 5 (1815)										
Job N	Manager: Mike Viola										
Fabrica	ation and Assembly										
Assum	ptions:										
	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	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						0	2.5		checked with primavera
11.05	Install lift support beams	2.0						40	2.5		checked with primavera
11.06	Remove from stand and measure weight of completed assembly and Move to holding area.	2.0						40	2.5		checked with primavera

WBS	Number: 185								
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	Fitle: FPA Oversight & Support (1802)								
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	ation and Assembly								
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	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								
	A2,B2,C2 Subtotal task 5-11 (total elasp time)	83			13	35	620		checked with primavera
Station	2-Modular Coil Subassembly-FP#2								checked with primavera
	Assemble/Align Mod-Coils A3/B3/C3	126				25	740	Sequence Plan R5	checked with primavera
	Assemble/Align Mod-Coils A4/B4/C4	83			13	35	620	Sequence Plan R5	checked with primavera
Station	n 2-Modular Coil Subassembly-FP#3								checked with primavera
	Assemble/Align Mod-Coils A5/B5/C5	126		<u> </u>	21	25	740	Sequence Plan R5	checked with primavera
	Assemble/Align Mod-Coils A6/B6/C6	83			13		620	Sequence Plan R5	checked with primavera
							020		checked with primavera
Station	3-Assemble Mod Coils and VVSA-FP#1								checked with primavera
	Misc Hardware		\$ 5.0K						checked with primavera
	Procure and load test 3 legged actuator System	4.0	\$ 43.0K			96 3.0			checked with primavera
	Procure, Fabricate and load test 3 legged actuator Lift Fixture Begin Assembly of First Field Period Assy	8.0 2.0	\$ 6.0K			128 2.0			checked with primavera
	Fab new platform legs	4.0				40 2.5 64 2.0			checked with primavera checked with primavera
	Install station 3 platforms (8 required)	4.0	\$ 10.0K			112 3.5			checked with primavera
	Test out station 3 equipment and procedures		\$ 10.0K			0 2.5	5		checked with primavera
									checked with primavera
1.00	Assembly Step Pre-Installation set-up								checked with primavera checked with primavera
1.01	Install Station 3 site monuments as needed to perform metrology measurements.	3.0	\$ 2.0K			60 2.5	5		checked with primavera
1.02	Install floor mounted tracks and VV base support		\$ 1.0K			100 2.5			checked with primavera
1.03	Use rigging operations to establish the MCHP CG location.	2.0				40 2.5			checked with primavera
2.00	Pre-assemble left MCHP					0 2.5			checked with primavera
2.01	Install MCHP support cart assemblies Verify cart motion. Move left cart to final assembly position to accept left MCHP and secure to the floor	4.0				80 2.5	5		checked with primavera
2.02	supports. Move right cart far to the right.	2.0				40 2.5	5		checked with primavera
2.03	Install adjustor bar support weldment on Left Side	0.0				0 2.5			checked with primavera
2.04	Using the SISSCO crane, position left MCHP on the cart assembly Secure left MCHP at three location to vertical support posts on support cart base.	1.0 2.0				20 2.5			checked with primavera
2.05	Measure the monuments on the positioned left MCHP and on the walls to establish the machine	2.0				40 2.5	7		checked with primavera
	coordinate for further assembly operations.	5.0					100	Metrology Staff Budgeted as LOE	checked with primavera
2.07	Set the positioning stop on the cart so it returns to the machine coordinate defined position in further assembly steps.	1.0				20 2.5	5		checked with primavera
3.00	Pre-assemble right MCHP	5				0 2.5			checked with primavera
3.01	Move the right base support cart to its final position ready to accept the right MCHP. Position the AirLoc	0.5				10 2.5			chacked with primaries
3.02	Wedgemount in a lowered position. Lift the right side MCHP using the SISSCO crane and position it to be ready to engage the preinstalled			+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +				checked with primavera
	Type-A flange guide bushings.	1.0				20 2.5	5		checked with primavera
3.03	Temporary fasteners located adjacent to the alignment bushings can be used to help bring the parts together.	0.0				0 2.5	5		checked with primavera
3.04	While held by the crane bring the AirLoc Wedgemount leveler up to take the load.	0.0				0 2.5			checked with primavera
3.05	Install temporary scaffolding to install flange hardware	1.0				20 2.5			checked with primavera
3.06	Install bolts and shims as needed for assembly tolerances.	1.0				20 2.5			checked with primavera
3.07	Tighten flange fasteners to 50% Perform metrology measurements of all alignment fiducials on both MCHP's. The maximum deviation	1.0				20 2.5	o		checked with primavera
3.08	from the reference points should be .020" or less.	5.0					100	Metrology Staff Budgeted as LOE	checked with primavera
3.09	Perform position adjustments on the right side MCHP if needed. Loosen all studs, adjust AirLock								
	Wedgemounts as needed and install alternate sized shims. Re-torque all studs to 50% and recheck.	2.0				40 2.5	5		checked with primavera
3.10	Verify 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
55									
3.11	done as part of 3.08 if 3.09 not needed Remove flange hardware and temporary platforms	1.0	1			20 2.5	00		checked with primavera

WRC	Number: 185									
	Title: Assembly of Field Periods				+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +	-+			
					+ + + + + + + + + + + + + + + + + + + +				_	
	Numbers: 1802, 1810, and 1815								1	
	Title: FPA Oversight & Support (1802)									
Job 1	Fitle: FPA Operations - Stations 1, 2, & 3 (1810)									
Job 1	Fitle: FPA Operations - Station 5 (1815)									
Job I	Manager: Mike Viola									
L										
	ation and Assembly ptions:								_	
Assum										
	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									
4.00	Parallel ops for sta 2		A 0.016							
4.00	Install laser screens - Stablish a global coordinate system based on the full period geometry. Measure the monuments on the		\$ 2.0K							checked with primavera
4.01	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						م د			ale and and address of
4.03	in the Stage 3 drawings. Turn each lasers on and with metrology determine their alignment. Record the laser position.	2.0		-		40	2.5			checked with primavera checked with primavera
4.04	Based on metrology measurements of the screens and lasers the screens path can be defined by the	1.0		-	+ + + + + + + + + + + + + + + + + + + +	20				
	back office. Print the path on milar paper and using metrology mount the milar on the screens.					0	2.5			checked with primavera
4.05	Disengage the MCHP's by using the left support and adjustor bar to move the left MCHP.	1.0				20	2.5			checked with primavera
4.06	Remove both MCHP's.								Can these stay on the carts and be	and the second second
5.00	Install vacuum vessel	2.0				40	2.5		rolled all the way back?	checked with primavera
5.00	Remove the adjustor bar support from left side.	0.0				0	2.5			checked with primavera checked with primavera
5.02	Install VV NBI port support stand.	2.0				40	2.5			checked with primavera
5.03	Install VVSA to base support and make the connection to the NBI port attachment.	1.0				20	2.5			checked with primavera
5.04	Using metrology take tooling ball readings off the VV shell to properly position the VVSA to the global									
6.00	coordinate system. Secure the VVSA to the base and at the NBI port support stand. Install left MCHP over VV	2.0				40	2.5			checked with primavera
6.00	Install any bumper protection components on the VV (left and right side) before manipulating left MCHP					0	2.5			checked with primavera
	over the VV.	0.5				10	2.5			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	0.0					2.5			checked with primavera
6.03	AirLoc Wedgemount in a lowered position. Using the SISSCO actuators with laser guidance move the left MCHP over the VV.	2.0				40	2.5			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									
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 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			 	0	2.5			checked with primavera
	ITS FINAL POSITION and pause. Go to the next step.	2.0				40	2.5			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			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			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	2.5			checked with primavera
7.07	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 scatfolding to install flange hardware Install bolts and all alumina and inboard weld shims.	2.0				80	2.5			checked with primavera checked with primavera
7.10	Tighten flange fasteners to 50%	1.0			+ + + + + + + + + + + + + + + + + + + +	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				25				zazzada mar primavora
	found back off on sufficient adjacent bolts to allow a replacement shim to be inserted. Tighten bolt and	1.0				20	2.5			checked with primavera
7.12	recheck. Perform metrology measurements of all alignment fiducials on both MCHP's. The maximum deviation	1.0				20	2.5			checked with primavera
	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									
1	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									
L	other tasks) and 3 days to install	10.0	<u> </u>			200	2.5	[checked with primavera
			-					_		

WBS Number: 185								
VBS Title: Assembly of Field Periods								
ob Numbers: 1802, 1810, and 1815								
ob Title: FPA Oversight & Support (1802)								
bb Title: FPA Operations - Stations 1, 2, & 3 (1810)								
ob Title: FPA Operations - Station 5 (1815)								
ob Manager: Mike Viola								
brication and Assembly								
sumptions:								
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								
.16 Tighten nuts 100%. Measure before welding adequate coil alignment and fit-up of shims	1.0				20	2.5		checked with primavera
3.00 Weld all inboard shims					0			checked with primavera
8.01 Follow a predefined weld sequence at all MC's and partially weld the inboard shim. Perform weld peening	45.0				300	2.5		alian da a d
operation. Perform a metrology measurement to re-verify coil alignment. 3.02 Final complete MC scan to verify period alignment.	15.0				300	2.5	Metrology Staff Budgeted as LOE	checked with primavera checked with primavera
0.00 VVSA attachment to MC.	5.0					2.5	metrology Starr Budgeted as LOL	checked with primavera
2.01 Attach VV permanent vertical supports to the MC at the two outboard connection points at the top and	_				0	2.5		cnecked with primavera
bottom of the Type-A MC.	2.0				40	2.5		checked with primavera
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 primavera
1.03 Disconnect base support and transfer load to VV vertical supports.	1.0				20			checked with primavera
9.04 Install VV lateral supports and align VVSA to modular coils	4.0				80			checked with primavera
Prepare VVSA for transport. Install blocking as required to prevent any motion relative to the modular								
coils. 7.00 Transfer Period to NCSX test cell.	2.0				40	2.5		checked with primavera
0.01 Install crane rigging to MCWF and transfer the unit to the transfer support frame. Secure Period /support	-				0	2.5		checked with primavera
frame to the transporter.	2.0				80			checked with primavera
0.02 Transfer completed Period to Station 5 located in NCSX test cell.	1.0				40			checked with primavera
Subtotal FP#1	115	5			1990	500	2495	checked with primavera
Station 3-Assemble Mod Coils and VVSA-FP#2								checked with primavera
Perform above sequence	115	\$ 5.0K			1990	2.6 500.0		checked with primavera
Station 3-Assemble Mod Coils and VVSA-FP#3								checked with primavera
Perform above sequence	115	\$ 5.0K		 	1990	2.6 500.0		checked with primavera
i oriorii abovo sequence		ψ 0.01		<u> </u>	1000	2.0 000.0		C.OC.CO WILL PHIMAVEL

TASK DESCRIPTION Work By 15	
Job Title: FPA Operations - Station 5 (1815) Assumes 5 day workweek 1 shift no operation Facilities the station of the station	
Job Title: FPA Operations - Station 5 (1,8 to 3 (1810)) Job Title: FPA Operations - Station 5 (1815) Job Title: FPA Operations - Station 5 (1815) Job Manager: Mike Viola Assumes 6 day workweet 1 shift no overtime Paralled ops for at 8 (2 finance availabile) Paralled ops for at 9 (7 finance availabile) Paralled ops for at 8 (8 finance avai	
Job Title: FPA Operations - Station 5 (1815) Job Manager: Mike Viola Fabrication and Assembly Assumes 5 day workweek 1 shift no overtime	
Job Title: FPA Operations - Station 5 (1815) Job Manager: Mike Viola Assumption: Assumption: A	
Job Title: FPA Operations - Station 5 (1815) Job Manager: Mile Viola Parallel ops for sta 5 fit futures available) Only 1 fixture for station 5 (in NCSX TC) Parallel ops for sta 5 fit futures available) Parallel ops for sta 5 fit futures available ops for sta 6 fit futures available) Parallel ops for sta 5 fit futures available) Parallel ops for sta 5 fit futures available ops for sta 6 fit futures available ops for sta 6 fit futur	
Job Manager: Mike Viola Assumes 5 day workweek 1 shift no overrime	
Exhibition and Assembly Assumption: Parallel ops for sts 5 (2 flutures available) Parallel ops for sts 5 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 5 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 5 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Basis of Editinate Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Basis of Editinate Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Basis of Editinate Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only Basis of Editinate Parallel ops for sts 2 (2 flutures available) Only 1 fluture for station 3 only 3 o	
Assumptions: Assumes 5 day workweek 1 shift no overtime Parallet ops for sts 5 (2 littures available) Parallet ops for sts 5 (2 littures available) Parallet ops for sts 5 (2 littures available) Parallet ops for sts 2 (2 littures available) TASK DESCRIPTION Work 9	
Assumptions: Assumes 5 day workweek 1 shift no overtime Parallet ops for sts 5 (2 littures available) Parallet ops for sts 5 (2 littures available) Parallet ops for sts 5 (2 littures available) Parallet ops for sts 2 (2 littures available) TASK DESCRIPTION Work 9	
Assumptions: Assumes 5 day workweek 1 shift no overtime Parallet ops for sts 5 (2 littures available) Parallet ops for sts 5 (2 littures available) Parallet ops for sts 5 (2 littures available) Parallet ops for sts 2 (2 littures available) TASK DESCRIPTION Work 9	
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Only 1 fixture for station 3 only Parallel ops for sta 2	
Parallel ops for sta 2	
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TASK DESCRIPTION Work St. D. D. Basis of Estimate Basis of Estimate Authority of the St. D. D. D. Basis of Estimate Shop based on similar tasks, tempered (adjusted) for complexity of the Aving to do all welds from inside of the Aving to d	cked with primavera
Job: 1815 - Field Period Assembly Station 5 (in NCSX TC)-VIOLA Sation 5- Final FP Assy - PP#1 (in NCSX TC) metrology network Bott on 5- Final FP Assy - PP#1 (in NCSX TC) metrology network	
Job: 1815 - Field Period Assembly Station 5 (in NCSX TC)-VIOLA Station 5- Final FP Assay - FP#1 (in NCSX TC)	
Job: 1815 - Field Period Assembly Station 5 (in NCSX TC)-VIOLA Station 5- Final FP Assay - FP#1 (in NCSX TC)	
Job: 1815 - Field Period Assembly Station 5 (in NCSX TC)-VIOLA Station 5- Final FP Assy - FPF1 (in NCSX TC) Retrosport networks Boil on 2- Port Extensions needed for first Plasma diagnostics MTM NCR Hardware reputable (bit list & cover plates) Welf Wire & weld supplies Testout Sis 6 aquipt & covered and the section of the sectio	cked with primavera
Job: 1815 - Field Period Assembly Station 5 (in NCSX TC)-VIOLA Station 5- Final FP Assy -FPF1 (in NCSX TC) metrology network But on 2 Pont Extensions needed for first Plasma diagnostics 1.0 MTM NCR Hardware reputations (in Section 1.0) Testor State of Section 1.0 Testor State of Section 1.0 Testor State of Section 1.0 Station 5- Final FP Assy -FPF1 (in NCSX TC) metrology network MTM NCR Hardware reputations (in Section 1.0) MTM NCR Hardware reputations (in Section 1.0) Testor State of Section 1.0 Testor State	
Obs. 1815 - Field Period Assembly Station 5 (in NCSX TC)-VIOLA Station 5- Final FP Assy -FP4 (in NCSX TC)	
Station 5- Final FP Assy -FP81 (in NCSX TC) Station 5- Final FP Assy -FP81 (in NCSX TC)	cked with primavera
Station 5- Final FP Assy -FP81 (in NCSX TC) metrology network Bott on 2- Port Extensions needed for first Plasma diagnostics 1.0 \$ 7.0K \$ 100 ports provided by WBS 38 detected for first Plasma diagnostics	cked with primavera
metrology network 10.0 \$ 7.0K 160 10.0	cked with primavera
Bolt on 2 Port Extensions needed for first Plasma diagnostics 1.0	cked with primavera
Bolt on 2 Port Extensions needed for first Plasma diagnostics 1.0	cked with primavera
MTM NCR Hardware repurchase (bolt kits & cover plates) Weld Wire & Weld supplies Testout Sta 5 equipt & procedures Station Station Sequence of the control	cked with primavera
Testout Sta 5 equipt & procedures	cked with primavera
Check 3 sled interfaces adjust holes	cked with primavera
Fixtures installed - final metrology	cked with primavera
Miscellaneous for tooling Station 5 preinstallation in parallel 1.00 Component preparations 1.01 The short dome port (the one on the top of the dome) needs to cut off near the dome. The longest port can remain. 1.02 Install heat tape and theomocouples on all ports. 1.03 Install insulation system around all ports. 1.04 Install insulation system around all ports. 1.05 Install insulation system around all ports. 1.06 Install insulation system around all ports. 1.07 Pre-installation set-up 1.08 Install insulation system around all ports. 1.09 Install insulation system around all ports. 1.00 Install insulation system around all ports. 1.00 Install insulation system around all ports. 1.01 Install insulation system around all ports. 1.02 Install insulation system around all ports. 1.03 Install insulation system around all ports. 1.04 Install insulation system around all ports. 1.05 Install insulation system around all ports. 1.06 Install insulation system around all ports. 1.09 Pre-installation set-up 1.00 Install insulation system around all ports. 1.00 Install in	cked with primavera
Station 5 preinstallation in parallel 1.00 Component preparations 1.01 The short dome port (the one on the top of the dome) needs to cut off near the dome. The longest port can remain. 1.02 Install insulation system around all ports. 1.03 Install insulation system around all ports. 1.04 Install insulation system around all ports. 1.05 Install insulation system around all ports. 1.06 Install insulation system around all ports. 1.07 Install insulation system around all ports. 1.08 Install are pa and theomocouples on all ports. 1.09 Install per Install are pa and theomocouples on all ports. 2.00 Install per Install are pa and theomocouples on all ports. 2.01 Install per Install are pa and theomocouples on all ports. 2.02 Install per Install are pa and theomocouples on all ports. 2.03 Install per Install are pa and theomocouples on all ports. 2.04 Install per Install around support fixture 2.05 Install per Install around support fixture 2.06 Install per Install around support fixture 2.07 Install per Install around support stand. Use leveler pad to engage base of MC. Add bolts to secure in place. 2.06 Install internal VV working platforms 2.07 Install internal VV working platforms 2.08 Install internal VV working platforms 2.09 Install internal VV working platforms 2.00 Install internal VV working platforms 2.01 Install internal VV working platforms 2.02 Install internal VV working platforms 2.03 Install internal VV working platforms 2.04 Install internal VV working platforms 2.05 Install internal VV working platforms 2.06 Install internal VV working platforms 2.07 Install internal VV working platforms 2.08 Install internal VV working platforms 2.09 Install internal VV working platforms 2.09 Install internal VV working platforms 2.00 Install internal VV working platforms 2.01 Install internal VV working platforms 2.02 Install internal VV working platforms 2.03 Install internal VV working platforms 2.04 Install internal VV working platforms 2.05 Install internal VV working plat	cked with primavera
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can remain. 2.0 40 2.5 Covered in Station 2 LED: Reversed order of 1.02 & 1.03 Install heat tape and theomocouples on all ports. 0.0 0	cked with primavera
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2.01 Install period support fixture 2.0 40 2.5 checks 2.02 Install FPA on support stand. Use leveler pad to engage base of MC. Add bolts to secure in place. 2.0 40 2.5 checks 2.03 Install external working platforms 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	cked with primavera cked with primavera
2.02 Install IPA on support stand. Use leveler pad to engage base of MC. Add bolts to secure in place. 2.0 40 2.5 Checked	cked with primavera
Install FPA on support stand. Use leveler pad to engage base of MC. Add bolts to secure in place. 2.0 2.03 Install external working platforms 3.00 Install internal VV working platforms 3.00 Install the domes (left and right side), inserting the long dome port through the MC opening, and weld the dome shell to the VV. 3.00 Install the dome shell to the VV. 3.00 Install amail dome ports and remaining circular ports. Use a guide tool located at the MC hole opening to	with primavera
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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. 40 2.5 checks and remaining circular ports. Use a guide tool located at the MC hole opening to	cked with primavera
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3.02 Install small dome ports and remaining circular ports. Use a guide tool located at the MC hole opening to	cked with primavera
	sked with primavera
morp support and control the port. I one should already have insulation, realer tape and thermocouples on	
them. 30.0 600 2.5 checks	cked with primavera
	cked with primavera
5.01 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. 6.0 72 1.5 in parallel with 5.02 checks	cked with primavera
5.02 Install MC coolant lines on each MC and position them for the TF installation and routing through PF	wiiii piiiilavela
structure. 12.0 240 2.5 checks	cked with primavera
	cked with primavera
	cked with primavera
6.01 Rotate two individual TF coils over the MC on the right side and temporarily support them off the Type-B and CMC's checked.	okod with primay
and C MC's. 2.0 40 2.5 check	cked with primavera

WRS	Number: 185								T			
	Title: Assembly of Field Periods											
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	lumbers: 1802, 1810, and 1815											
	itle: FPA Oversight & Support (1802)											
	itle: FPA Operations - Stations 1, 2, & 3 (1810)											
	itle: FPA Operations - Station 5 (1815)											
Job N	lanager: Mike Viola											
Eabrica	tion and Assembly											
Assum												
	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				ı							
	Parallel ops for sta 2											
6.02	Attach the temporary support at the end of the Type-C MC used to unload the a pair of center supports.											
		1.	0					20	2.	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.	o						2.	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							40				
6.05	needed). Slide the first TF assembly against the TF support bracket and secure in place with the mating support	2.	U	-				40	2.	פ		checked with primavera
	bracket.	1.						20				checked with primavera
6.06	Install TF support brackets (top & bottom) to the port 12 side on the Type-B MC.	2.	0					40	2.	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.	o					20	2.	5		checked with primavera
6.08	Install machine support plates (inboard and outboard) on the bottom, spanning two TF coil support											
6.09	brackets. Reinstall leveler pad to engage base of MC on the right side.	3.						60				checked with primavera
6.10	Installed one side of the TF support brackets on the Type-C coil (top and bottom) for the TF installation to	0.	0									checked with primavera
	occur at Station 6.	1.	0					20	2.	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.	o					260	2.	5		checked with primavera
	TF fit-up check											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		checked with primavera
9.00	Install Ports 4 Tack weld the left and right port 4's. Use a local laser attached to the port cover to define the port	_	- 									checked with primavera
	trajectory and to aid positioning in port during welding.	2.						40				checked with primavera
	Install boots on both port 4's.	4.	0					80	2.	5		checked with primavera
10.00	Installation of PF structural members and routing of MC coolant and leads. Install the PF coil support structure that surround the TF coils. In doing this the MC leads and coolant											checked with primavera
10.01	lines need to be routed to the outside of the PF structure. PF structure is only partially installed at the											
44.00	Type-C MC's.	8.	0					160	2.	5		checked with primavera
11.00	MC header installation and coolant connections Install the MC coolant manifold outside of the PF structure in the area of PF6.	3.	0					60) 2.	5		checked with primavera checked with primavera
11.02	Connect all MC coolant lines to the manifold (40 lines top and bottom)	0.	9					00	, 2.	5	Flex lines but need field supports	checked with phinavera
	` ' '	20.	o					400	2.	5	installed	checked with primavera
	Diagnostic											checked with primavera
12.01	Install Rogowski coils on the end of the VV, left side. Route leads through space between port 8 and spool port opening and coil onto shell of MC for future routing	5.						100	2.	5		checked with primavera
13.00	Spool port opening and coil onto shell of MC for future routing Final measurements	5.	-					100	1 -2	<u> </u>		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						<u> </u>	100	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.	1.								20	Metrology Staff Budgeted as LOE	checked with primavera
13.03	Using monuments on the VV for alignment, bring the VV into proper alignment. Make final adjust in the VV supports to secure VV in place.	4.						80	2.	5		checked with primavera
13.04	Install or identify three primary fiducials that will be used in positioning the Period in Station 6.	2.						40				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										Metrology Staff Budgets day 1.05	i di
12 10	results. Final Acceptance tests	5.	0							100	Metrology Staff Budgeted as LOE	checked with primavera
	Final Acceptance tests Check Assembly (bolts, etc)	5.		-				100) 2.	5		checked with primavera checked with primavera
13.12	Check Diagnostics (Loops, thermocouples)	5.						100				checked with primavera
13.13	Check manifolds (pressure, flow, etc.)	5.						100				checked with primavera
13.14	Check 6 modcoils (voltage etc)	6.						120	2.	5		checked with primavera
13.15	Check trim coils (voltage etc)	3.						60				checked with primavera
	Check TF coils (voltage etc) Transfer Period to final assembly (Station 6).	6.	0					120	2.	5		checked with primavera checked with primavera
14.00	Install crane rigging to completed Period assembly	2.	0	1				40) 2.	5		checked with primavera
14.02	Remove platforms	1.						20				checked with primavera
14.03	Transfer completed Period to Station 6 located in NCSX test cell.	2.						40				checked with primavera
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Job Title: FPA Operations - Station 5 (1815)								
Job Manager: Mike Viola								
Fabrication 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								
Install on support platform (incl in job 7503)								checked with primavera
subtotal	196	6 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