

NCSX June 2007 ETC

TABLE IV - Uncertainty of Estimate and Residual Risk Assessment

WBS Number: 185  
WBS Title: Assembly of Field Periods  
Job Numbers: 1802, 1810, and 1815  
Job Title: FPA Oversight & Support (1802)  
Job Title: FPA Operations - Stations 1, 2, & 3 (1810)  
Job Title: FPA Operations - Station 5 (1815)  
Job Manager: Mike Viola

**Uncertainty of the Estimate**

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

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

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Residual Impacts								
Job	Risk Description	Likelihood of Occurring	Mitigation Plan	Basis of estimate	Cost Impact		Schedule Impact	
					Low	High	Low	High
1802	Loss or prolonged unavailability of certain key personnel (Viola or Perry) from the project could substantially impact the schedule.	VU	Viola and Perry will be cross-trained such that each could do the other's job	Estimated impact is <1 months on the critical path. Cost estimates cover 0-1 months of near term FPA assembly (in addition to the standing army costs addressed under schedule impact).	+\$0	+\$150	+ 0.00	+ 0.50
1810	"Back office" support for FPA and final assembly becomes a chronic bottleneck, stretching out the time required to complete assembly operations	VU	Additional support budgeted for Brown, Brooks, and Ellis providing "2 deep" back office support. Should be available to mitigate peak demands once training in key skills is completed.	Estimated impact is <2 months on the critical path. Cost impact covers up to 2 months of FPA/final assembly.	+\$0	+\$600	+ 0.00	+ 2.00
	Modular coil damaged during assembly requiring significant rework to coil	VU	Equipment will be handled during FPA using carefully constructed procedures to minimize likelihood of damage.	Nominally repaired with a 2-man crew within 2 weeks	+\$10	+\$20	+ 0.00	+ 0.50
	VV surface component (coolant tube, flux loop, or TC) damaged during FPA requiring significant rework	VU	Equipment will be handled during FPA using carefully constructed procedures to minimize likelihood of damage.	Nominally repaired with a 2-man crew within 2 weeks	+\$10	+\$20	+ 0.00	+ 0.50

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Unacceptable distortion in a field period when welding modular coil shims requiring	VU	Likelihood of occurrence is very unlikely as a result of extensive welding R&D and careful monitoring during welding.	Cut apart and re-weld two coils back together. Nominally a 2.5-man crew in 12 weeks.	+ \$25	+ \$35	+ 0.75	+ 1.25
Field period damaged during loading, transport, or unloading from TFTR TC to NCSX TC	NC	Extreme care will be taken when transporting a field period renering this event extremely unlikely.	<i>Crisis event not covered by contingency</i>				
Metrology equipment and general purpose tooling/ lifting equipment (e.g.cranes) not available to support the schedule	U	Maintenance contract mitigates impact of metrology equipment.  Additional \$200K budgeted for a 3rd laser tracker and/or spare metrology equipment. Should result in improved efficiency.	Up to 2 week impact on FPA and critical path. FPA cost impact assumed to be \$300k/mo.	+ \$0	+ \$150	+ 0.00	+ 0.50
1815 Metrology equipment and general purpose tooling/ lifting equipment (e.g.cranes) not available to support the schedule	U	Maintenance contract mitigates impact of metrology equipment.  Additional \$200K budgeted for a 3rd laser tracker and/or spare metrology equipment. Should result in improved efficiency.	Up to 2 week impact on FPA and critical path. FPA cost impact assumed to be \$300k/mo.	+ \$0	+ \$150	+ 0.00	+ 0.50

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Multiple vacuum leaks during initial pumpdown	NC	Welds will be leak checked during FPA when leaks can be addressed without significantly impacting the critical path. Likelihood of many leaks appearing during initial pumpdown is considered extremely unlikely with this mitigation plan.	Impacts of having a few leaks is covered in estimate uncertainty with present mitigation plan
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- Notes:
- [1] Low cost and schedule impacts are considered the minimum (0-percentile) impacts should the event occur. High cost and schedule impacts are considered the maximum (100-percentile) impacts should the event occur
  - [2] Cost impacts should be entered as man-hours (by demographic) and M&S direct cost under basis of estimate. Cost impacts should NOT include standing army costs which are separately calculated from the schedule impact. Project control is responsible for quantifying the low and high cost impacts based on the labor hours and M&S identified
  - [3] The schedule impacts should be entered as the min and max impacts on the critical path. If there is no critical path impact then the schedule entries should be zero.
  - [4] Likelihood of occurrence should be entered consistent with our risk classification methodology, i.e. VL= Very Likely (P>80%), L=Likely (80%>P>40%), U=Unlikley (40%>P>10%), VU=Very Unlikely (P<10%), NC=Non-credible (P<1%)