

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

WBS Number: 142
WBS Title: Windings and Assembly
Job Numbers: 1408, 1451, & 1459
Job Title: Modular Coil Winding Supplies (1408)
Job Title: Modular Coil Winding Operations (1451)
Job Title: Modular Coil Punch List Items (1459)
Job Manager: Jim Chrzanowski

Uncertainty of the Estimate					
	<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Uncertainty Range (%)</u>	<u>Comments/Other Considerations</u>
Job 1408					
Design Maturity			X	-15%/+25%	Unknowns of equipment reliability Mostly off-the-shelf items
Design Complexity			X		
Job 1451					
Design Maturity	X			-15%/+25%	Known and proven procedures and processes Have built 12 coils and have proven processes even with tight metrology and tolerances.
Design Complexity	X				
Job 1459					
Design Maturity		X		-10%/+15%	Still uncertainty on number of field changes (e.g., number of holes, etc.) Standard field work.
Design Complexity			X		
<p>Note: High/Medium/Low uncertainty assessment from Job Manager. Uncertainty range based on ACEI recommended practice 18R-97 as amended for NCSX.</p>					

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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
1408 - NONE								
1451	Damage or loss of modular coil during VPI or testing requiring the conductor to be stripped off and re-wound	U	Continue to use same rigorous process used for first 12 coils during which there were no fabrication mishaps requiring re-winding a coil	~\$35K in materials; ~\$380K in labor. 7.5 months to do work with the potential for a 2 month re-impact on the critical path.	+ \$400	+ \$450	+ 0.00	+ 2.00
	Failure of major piece of winding equipment (e.g., motor, gear box, etc.) resulting in extended downtime in a winding station	U	Use three remaining winding stations to continue MC fabrication while fourth station is being repaired	~\$10K for equipment plus repair costs	+ \$10	+ \$30	+ 0.00	+ 0.00

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=Unlikely (40%>P>10%), VU=Very Unlikely (P<10%), NC=Non-credible (P<1%)

Assumptions

Cost: Would need ~\$4.5K of Epoxy + ~\$3K of insulation + \$1.5K of shell + ~\$5K of other misc components/materials + cost of new lead blocks of ~\$15K => round off to ~\$35K. Labor ~\$380K assuming ~4.5 months to rework and redo coil.

Schedule: To redo the coil: Need 138 shifts x 3 men/shift x 8 hours/shift => 3 months + To rework of ~65 shifts x 3 men/shift x 8 hours/shift => 1.5 months. Need an additional ~3 months to order lead blocks if needed. Anticipate ~3 months to re-order and obtain new lead blocks. If Type B coil is the one to fail, could add 1-2 months to critical path at an added "standing army" cost of ~\$260K/months or ~\$520K.