

**NCSX June 2007 ETC
TABLE III - Fabrication and Assembly**

WBS Number: 161
WBS Title: LN2 Distribution System
Job Number: 1601-161
Job Title: LN2 Distribution System
Job Manager: Paul Goranson

Fabrication and Assembly

Description:

This effort covers all the assembly time to put the cooling line tracing on the exterior of the vessel and ports, and to build the coolant manifolds

					Labor category			Basis of Estimate
	multiplier	unit	no.	hours	EMEM hrs	EMTB hrs	EADM hrs	
Fab operations summary								
Manifold Cooling Lines	615	hrs/lot	1	615	123	492	0	See Worksheet Below
subtotal	615			615	123	492	0	
Assembly operations summary					hrs	hrs		None - Part of Machine Assembly Jobs
<i>subtotal</i>	0			0	0	0	0	

Worksheets

coolant line pigtails from coils to manifolds

Average length of pigtail	3 ft									
	Total	TF	Modular	PF1	PF2	PF3	PF4	PF5	PF6	
No. of coils	38	18	18	2	2	2	2	2	2	2
circuits per coil at header		1	8	0.5	0.5	0.5	0.5	0.5	0.5	0.5
total circuits	168	18	144	1	1	1	1	1	1	1
Total number of pigtails	336	supply and return per circuit								

Manifolds for cooling lines

Assume 1 pair of 1.5 inch manifolds for each field period, one above and one below the midplane inside the PF5 coil

Each manifold will have 1/3 of the required cooling connections plus 25% spare

The manifolds will connect via vertical pipes to the supply system below the cryostat

avg toroidal perimeter of field period	16 ft	
avg vertical height of connection lines	9 ft	
no of header pairs	3	
cost of tubing	\$15 per foot, 316 SS	
cost per field period	\$2,232	
total number of coolant connections, all headers	840	
hours to weld each connection	0.5 hr per connection	
shifts to form manifold tube	0.5 per manifold pair	
crew size for forming	2	
hours to cut vertical pipes	2 hrs per pipe	
hours to weld vertical pipes to header	2 hrs per pipe	
total shifts for manifolds	62	
tech hours for manifolds	492 hours	
technical oversight, inspection	123 hrs	
total hours for manifolds	615 hrs	

Based on recent purchases for NCSX and UT at MDL

Based on recent experience at MDL
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