Snowmass BCD 40(+) Q & A has been taken as the current & evolving LC guidance.

Power -

The integrated LC Power system model has been developed using Slac analysis software. The model has developed Cryo/CTW and RF/LCW power subsystems in some detail. Less detailed, so far, are the Injectors, Damping Rings, Undulator, IR Halls & Dumps. Several dozens of configurations have been tried testing various Cryo & RF roll-ups.

RF-

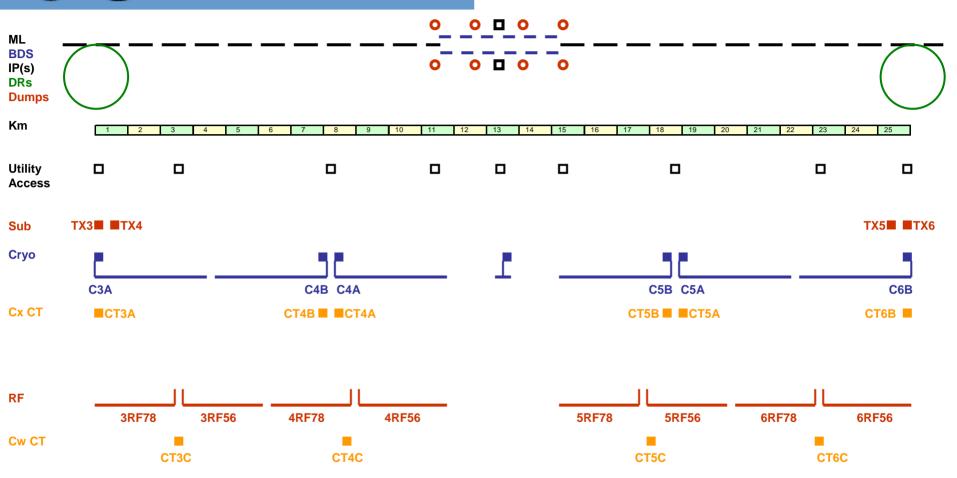
Marx Modulators have been modeled for 656 klystrons. (BCD modulators yet to be done) Modulator model at 99% power factor for 10 MW klystrons (85% pf yet to be done).

Cryo -

Power models for both 6 & 4 refrigerators have been modeled with true N+1 availability. Cryo models have been tested for pump-down, power transformer loss, compressor loss, and normal running using typical centrifugal cryo compressor performance curves.

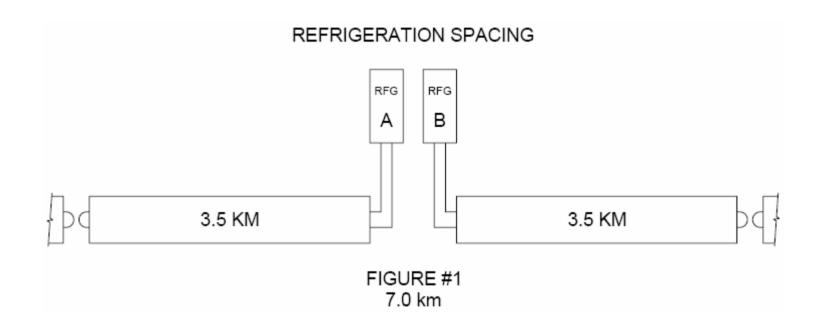
Layout -

RF & Cryo in the 250 GeV linac have been indexed together to conform 984 eight cavity, 12 meter cryomodules, to 328 klystrons & modulators, over a 11,808 meter total length.



6 Main Linac Cryo Refrigerators @ 0.5 TeV cm, Initial Gradient 31.5Mv/m, Qualified Gradient 35 Mv/m

2 of 6 Refrigerators



1 of 4 -&- 1 of 6 Cryo Refrigerators

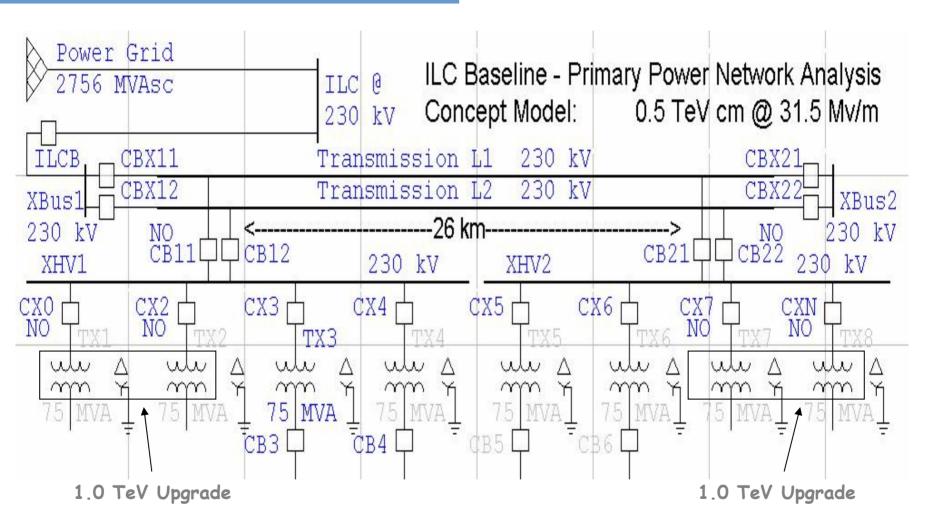
		,	
0.5 TeV cm	31.5 Mv/m Gradient 5.6 km/Refrig	1 of 4 Refrig Shown 99.3% Avail ea	ch
3x1 🗂 Su	b 3 TX31-TX32		3x
TX31	20/30 MVA		
WW 4	OA/FA 60 Hz		
	ability Cryo Refrigerator Base Load r unit Head Load to Cooling Tower W		
4.16 kV C3A	r unit head Load to cooling lower (water is 1 kva -1 kw001 Mva	
CT3A CB 309 CB 310 1750 HP 1750 HP 3LP 9 3LP 10	CB 311 CB 312 CB 313 CB 314 1750 HP 800 HP 800 HP 800 HP 3LP 11 3LP 12 3LP 13 3LP 14	CB 315 CB 316 CB 317 CB 31 800 HP 800 HP 2000 HP 2000 HB 3LP 15 3LP 16 3HP 17 3HP 1	2000 HP 2000 HP 3
#309 Hd #310 Hd	#311 Hd #312 Hd #313 Hd #314 Hd	#315 Hd #316 Hd #317 Hd #318 H	d #319 Hd #31# Hd
1035 kVA 1035 kV		553 kva 553 kva 1492 kva 1492 k	VA 1492 kVA 1492 kVA
3ACX Head Cooling			
Total NP Motor HP = 69,000	Total NP Cryo Transformer MVA = 80/	120 MVA OA/FA	
0.5 TeV cm	31.5 Mv/m Gradient 3.5 km/Refrig	1 of 6 Refrig Shown 99.3% Avail ea	ch
0.5 TeV cm	31.5 Mv/m Gradient 3.5 km/Refrig	1 of 6 Refrig Shown 99.3% Avail ea	ch
0.5 TeV cm 3x1		1 of 6 Refrig Shown 99.3% Avail ea	ch
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig 15 3 TX31-TX32 15/20 MVA OA/FA 60 Hz		
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig TX31-TX32 15/20 MVA OA/FA 60 Hz Lability Cryo Refrigerator Base Lo	paded 76%, w/24% Spinning Reserv	+
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig	paded 76%, w/24% Spinning Reserv	+
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig TX31-TX32 15/20 MVA OA/FA 60 Hz Lability Cryo Refrigerator Base Lo	paded 76%, w/24% Spinning Reserv Water is 1 KVA =1 KW =.001 MVA	
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig TX31-TX32 15/20 MVA OA/FA 60 Hz Lability Cryo Refrigerator Base Loer unit Head Load to Cooling Tower	paded 76%, w/24% Spinning Reserv Water is 1 KVA =1 KW =.001 MVA CB 314 CB 315 CB 316 CB 31	e 7 CB 318 CB 319
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig TX31-TX32 15/20 MvA OA/FA 60 Hz Lability Cryo Refrigerator Base Loer unit Head Load to Cooling Tower B 310 CB 311 CB 312 CB 313 D HP 1250 HP 500 HP 500 HP	caded 76%, w/24% Spinning Reserver Water is 1 KVA =1 KW =.001 MVA	7 CB 318 CB 319 2000 HP 2000 HP
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig TX31-TX32 15/20 MvA OA/FA 60 Hz Lability Cryo Refrigerator Base Loer unit Head Load to Cooling Tower B 310 CB 311 CB 312 CB 313 D HP 1250 HP 500 HP 500 HP	paded 76%, w/24% Spinning Reserv Water is 1 KVA =1 KW =.001 MVA CB 314 CB 315 CB 316 CB 31	7 CB 318 CB 319 2000 HP 2000 HP
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig ab 3 TX31-TX32 15/20 MvA OA/FA 60 Hz Lability Cryo Refrigerator Base Loer unit Head Load to Cooling Tower B 310 CB 311 CB 312 CB 313 OHP 1250 HP 500 HP 500 HP 10 3LP 11 3LP 12 3LP 13 3	caded 76%, w/24% Spinning Reserve Water is 1 KVA =1 KW =.001 MVA cB 314 CB 315 CB 316 CB 315 CB 316 CB 315 CB 316	7 CB 318 CB 319 P 2000 HP 2000 HP 7 3HP 18 3HP 19
0.5 TeV cm 3x1	31.5 Mv/m Gradient 3.5 km/Refrig TX31-TX32 15/20 MvA OA/FA 60 Hz Lability Cryo Refrigerator Base Loer unit Head Load to Cooling Tower B 310 CB 311 CB 312 CB 313 D HP 1250 HP 500 HP 500 HP	ceded 76%, w/24% Spinning Reserver Water is 1 KVA =1 KW = .001 MVA CB 314 CB 315 CB 316 CB 315 CB 314 CB 315 CB 316 CB 316 LP 14 3LP 15 3LP 16 3HP 1	7 CB 318 CB 319 2000 HP 2000 HP 7 3HP 18 3HP 19 d #318 Hd #319 Hd

Total NP Cryo Transformer MVA = 90/120 MVA OA/FA

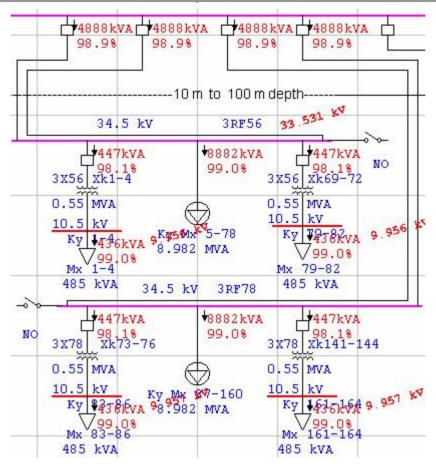


Total NP Motor HP = 73,500





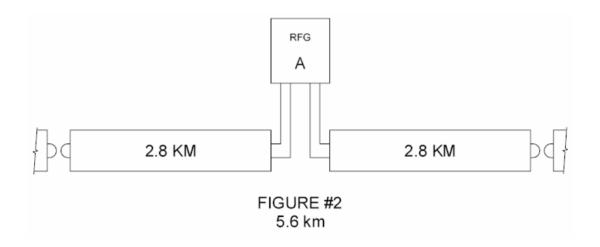
One of Four Marx RF Modulator Systems for 0.5 TeV cm @ 31.5 Mv/m

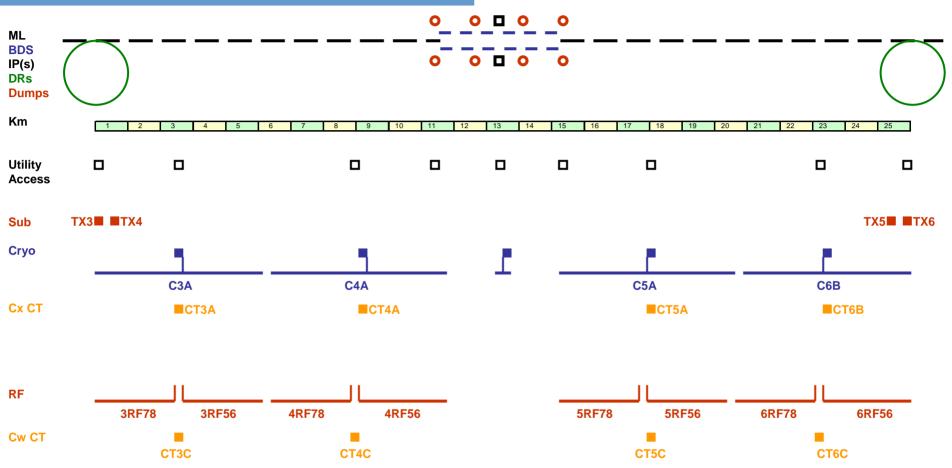


164 klystrons-modulators @ 100% Full Load Shown Above, To Index w/ 576 meter Cryo Maintenance unit.



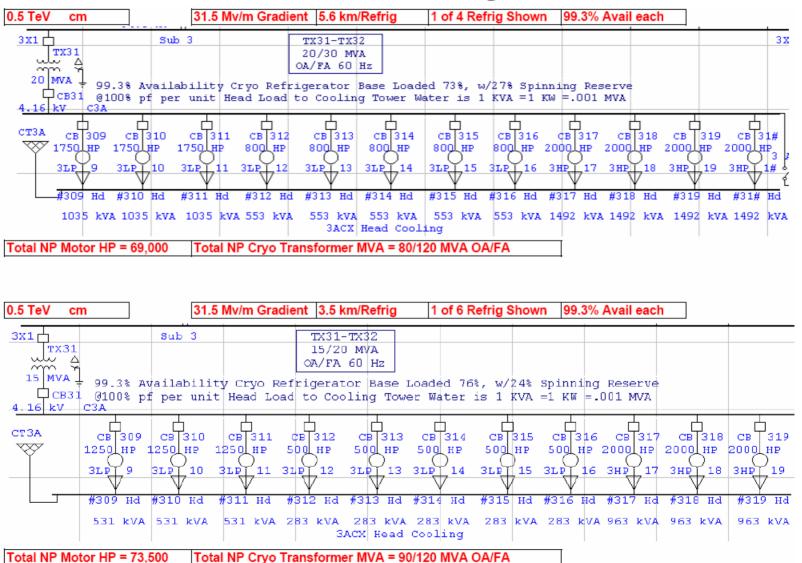
1 of 4 Refrigerators



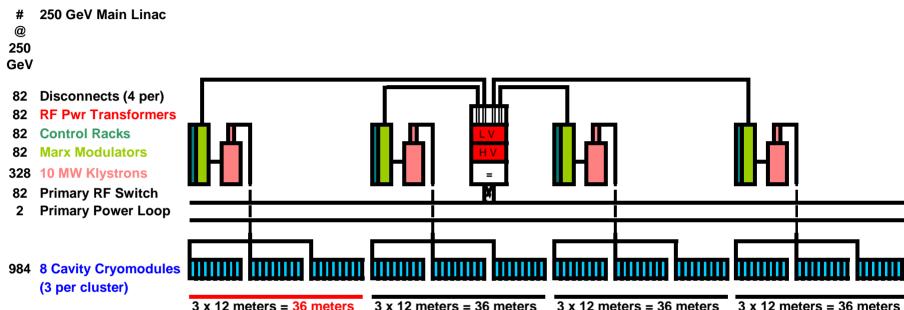


4 Main Linac Cryo Refrigerators @ 0.5 TeV cm, Initial Gradient 31.5Mv/m, Qualified Gradient 35 Mv/m

1 of 4 & 1 of 6 Refrigerators



RF & Cryo Maintenance Units



82 RF Power Unit

1 RF Power System

2 Cryo Refrigerators

24 Cryo Maint. Units

20.5 Cryo Maint. Units

RF Pwr Units per Cryo Maintnenace Unit

RF Power Unit = 144 meters

Total 250 GeV Linac RF Length: 82 x 144 meters = 11,808 meters

Total 250 GeV Linac Cryo Refrigerator Length: 11,808 / 2 = 5,904 meters

Total 250 GeV Linac Cryo Maintenance Unit Length: 11,808 / 24 = 492 meters

Total 250 GeV Linac Cryo Maintenance Unit Length: 11,808 / 20.5 = 576 meters = 16 x 36 meters

RF Power Units per Cryo Maintenance Units: 576 meters / 144 meters = 4

BCD baseline to Index Cryo & RF in the Main Linac

Suggest that the BCD cryo maintenance unit be 576 meters,

Or better stated, as the length of 48, eight cavity, 12 meter, cryomodules, whatever dimension that actually becomes.