

vi. Helium Inventory for RHIC

. The system-wide Helium inventory requirements are summarized in Table 3-10. Total operating inventory is approximately 6.6 million standard cubic feet. Of this, approximately 800,000 scf are in the refrigerator and compressor system, 2.3 million in each ring and about 1.2 million in storage, of which about half is unusable system tare volume.

A bank of 47 warm gas storage tanks has been installed near 1006B, which provides a storage capacity of about 3.3 million scf. Three liquid Helium Dewars have also been installed near 1006B, with a combined capacity of approximately 3.1 million scf. It has proven to be more cost effective to store the liquid helium off site, than to keep the Dewars cold during extended RHIC shutdowns.

Table 3-10. Estimated Helium Inventory

	Physical Volume (liter)	Equiv. Liquid Helium Vol. (liter)	Equiv. Vol. at Std. Cond. 1 atm, 298 K (1000 scf)
I - MAGNET COOLANT LOOP			
Regular Arc Components			
288 Dipole Assemblies	34560	39537	1067
276 CQS Assemblies	20700	23681	639
Sum for Magnet Interconnects	2096	2397	65
Insertion Region Components			
Dipoles			
12 DX Magnets	996	1139	31
24 D0, D5, D6, D8 Assemblies	8424	9637	260
Quadrupoles			
24 Q1-Q9 Assemblies	14688	16803	454
Sum for Magnet Interconnects	4606	5270	142
Vacuum Jacketed Piping			
Sum for Q3-Q4	7685	8792	237
Sum for D0-D0	8128	9299	251
15 Lead Pots	2465	2819	76
56 Cold/Warm Transitions	627	718	19
II - PIPING SYSTEM			
In Ring - 8710 m			
Recooler Supply	32388	37052	1000
Recooler Return	32388	5182	140
Utility Header	32388	5182	140
Shield	20933	3481	94
Refrigerator to Ring - 387 m			
Supply 2180	2494	67	
Return 8049	1288	35	
Shield	7367	1179	32
III - OTHER RING COMPONENTS			
12 - 225 W Recoolers	5220	5220	141
60 - 50 W Recoolers	2094	2396	65
Cold Gas in Storage Tanks	130000	17000	459
Refrigerator Work Inventory		23926	646
Working Margin		18768	507
Gas Storage Tare Volume	3398400	4889	132
TOTAL INVENTORY IN EQUIV. LIQ. LITERS		248148	
TOTAL INVENTORY IN 1000 scf			6600
IN STANDARD m ³			189723
TOTAL INVENTORY IN kg		31019	