



CRYOGENICS OPERATIONS 2008

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Organized by CERN

Cyclotron Tank Cryopumping and Cryogenics for Superconducting Facilities at TRIUMF

Igor Sekachev

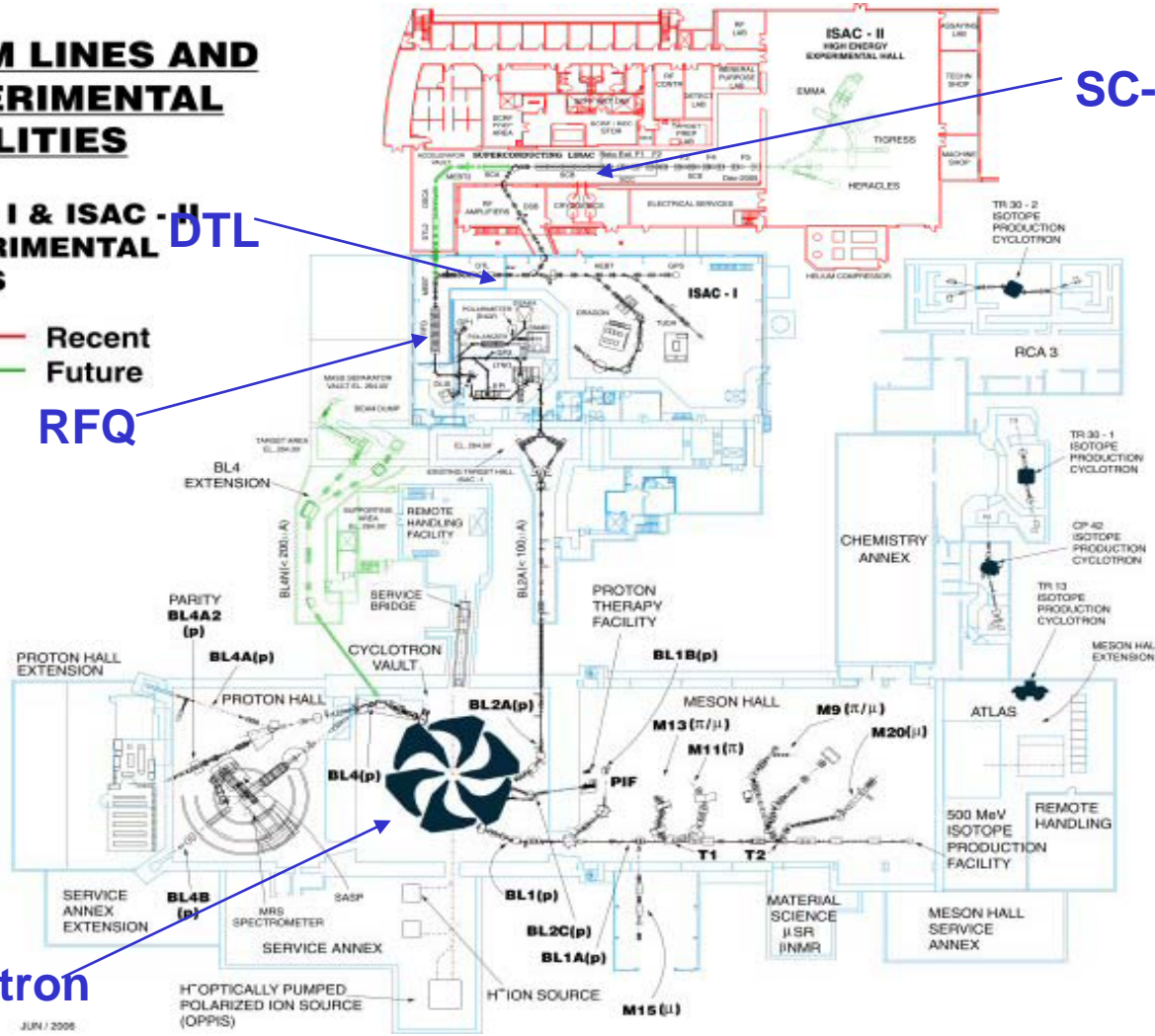


TRIUMF Accelerators

BEAM LINES AND EXPERIMENTAL FACILITIES

ISAC - I & ISAC - II EXPERIMENTAL HALLS

— Recent
— Future



SC-linac

DTL

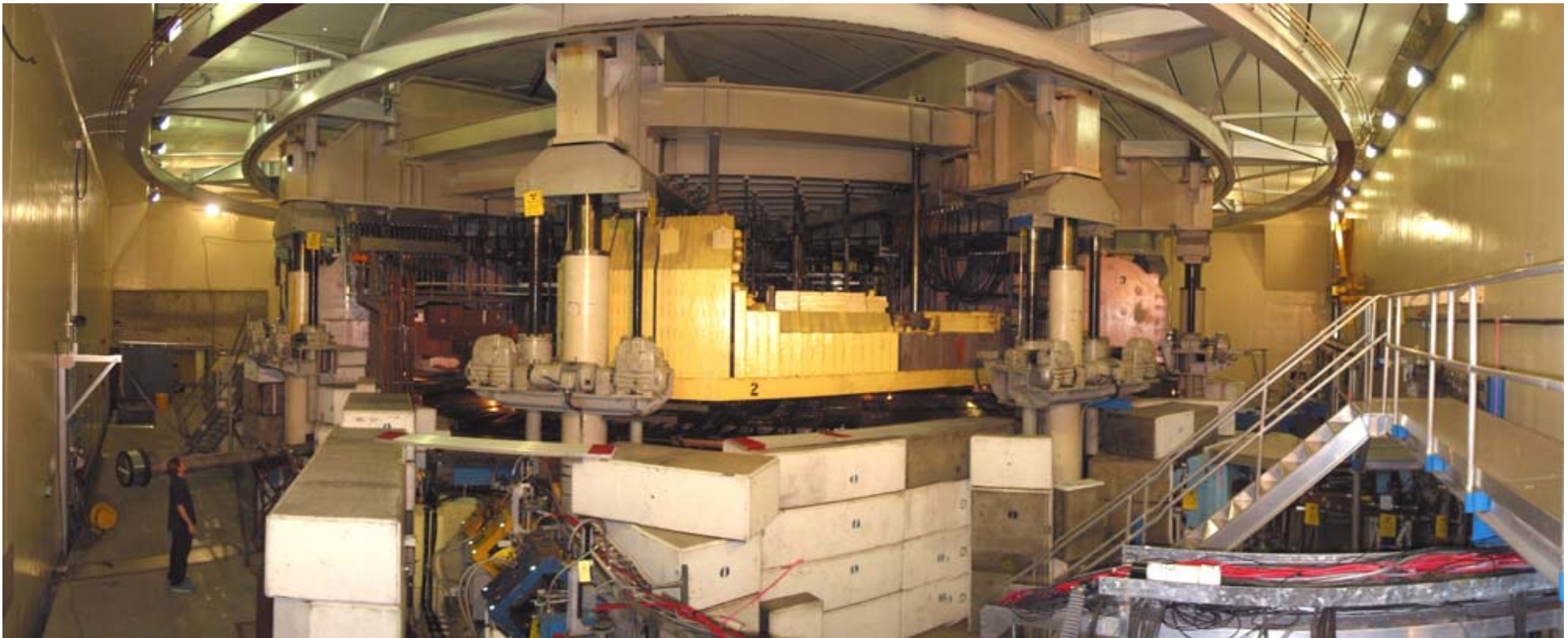
RFQ

Cyclotron



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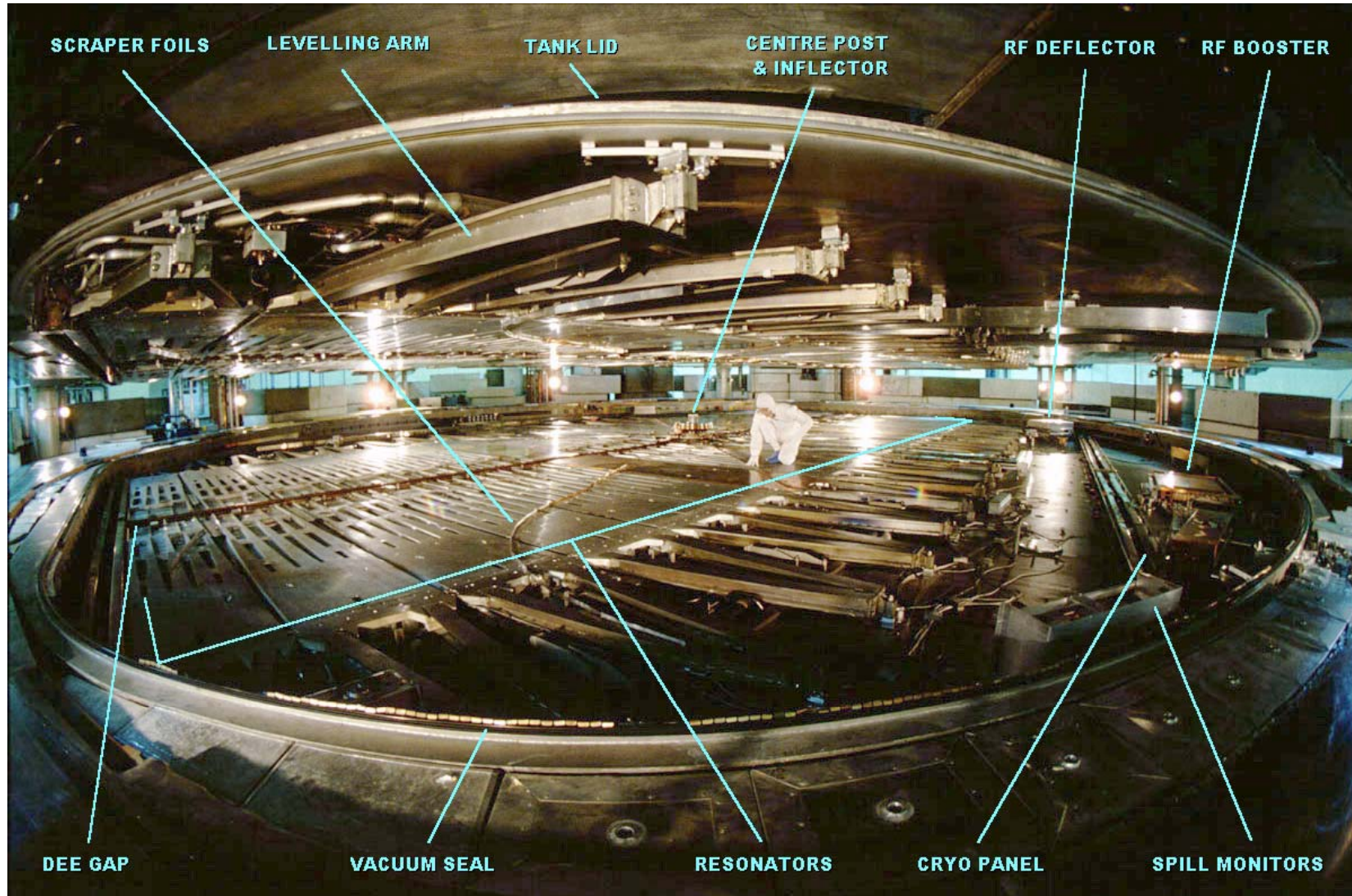
TRIUMF 500 MEV Cyclotron





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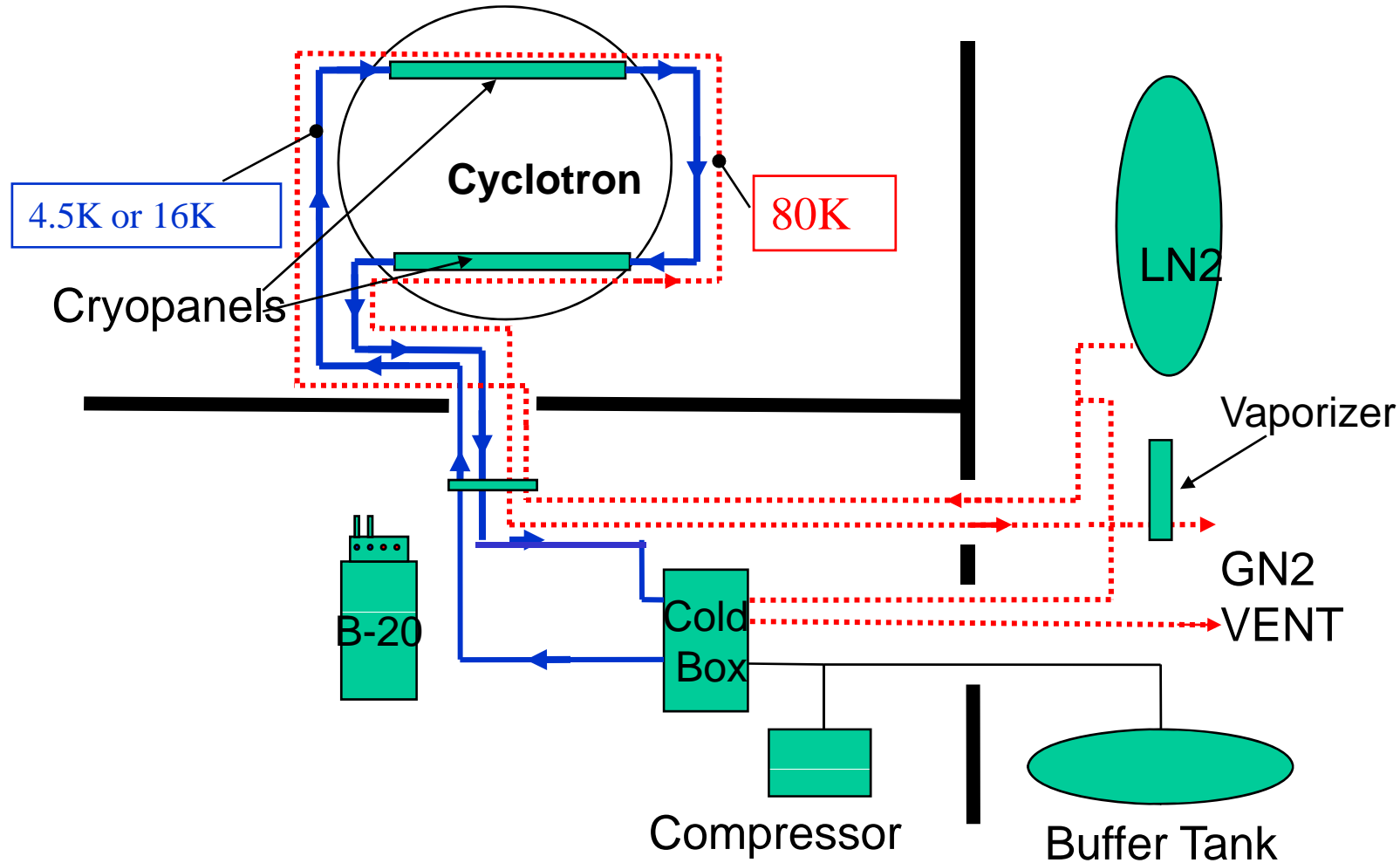
500 MeV Cyclotron with Lid Elevated





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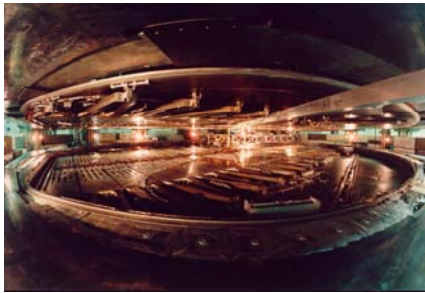
Cyclotron Cryogenic System



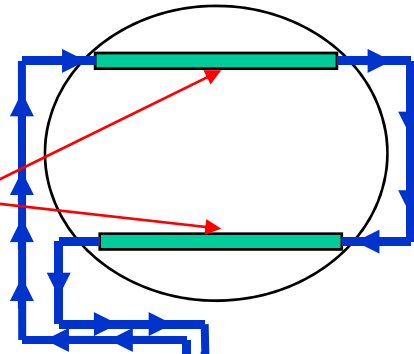


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Cyclotron Helium System



Cyclotron with Cryopanel



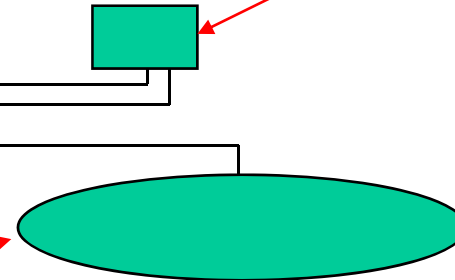
Cold Box



Compressor



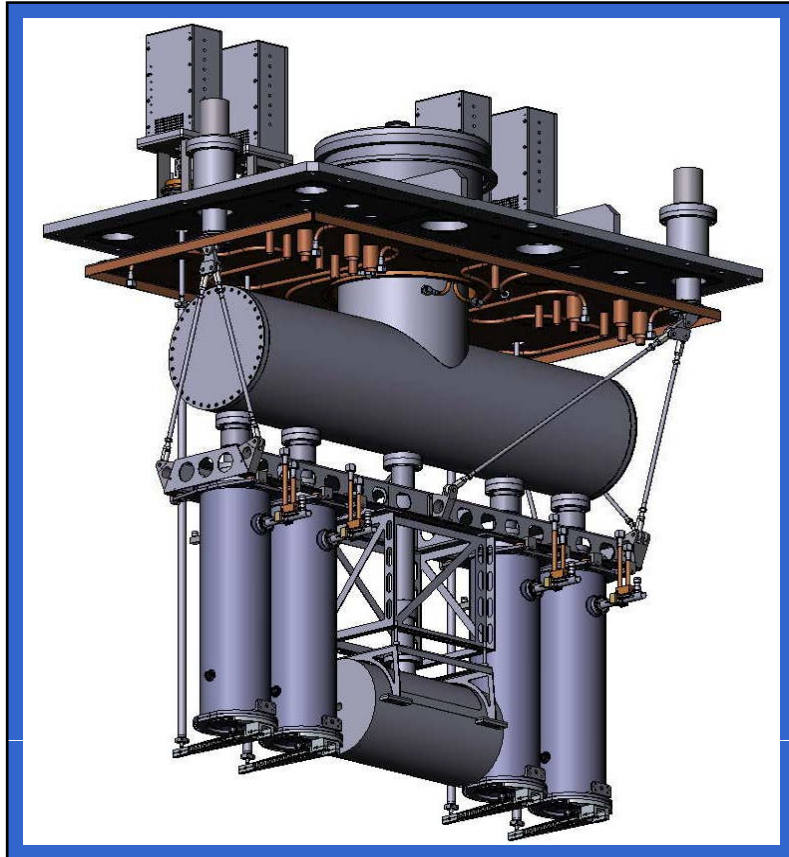
Buffer Tank





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ISAC Cryomodule



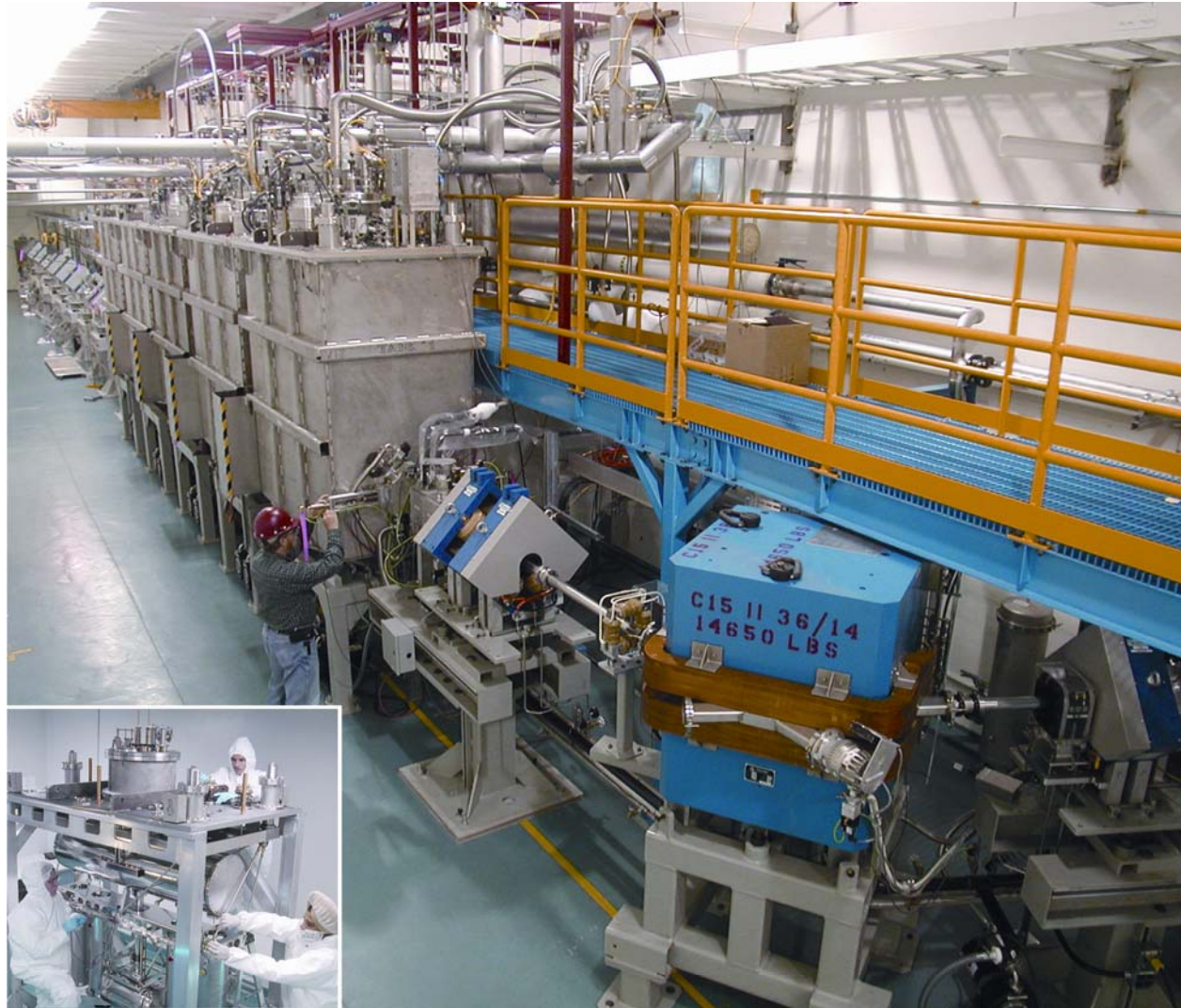
Assembly in Clean Room





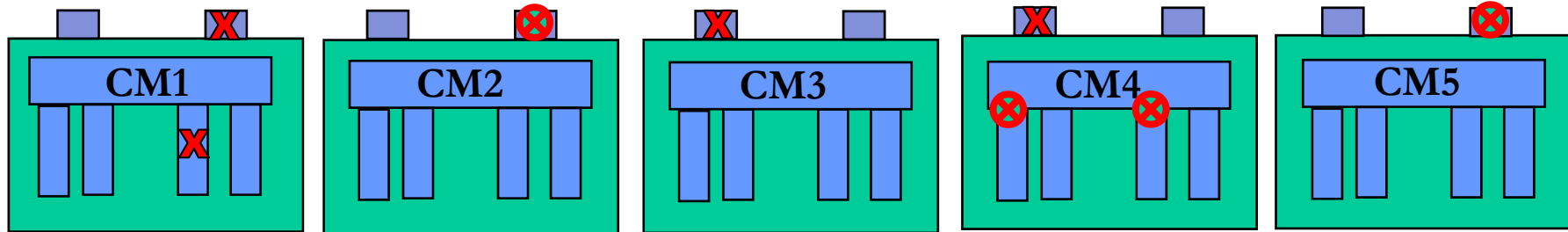
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ISAC SC-linac Phase-I (April 2006)





SC-linac Shutdown Work



X First Warm-up

- Remove CM1 to the clean room for repair of the coupling loop drive
- Replace three turbo-pumps; two in situ using clean procedures (found one pump disintegrated)

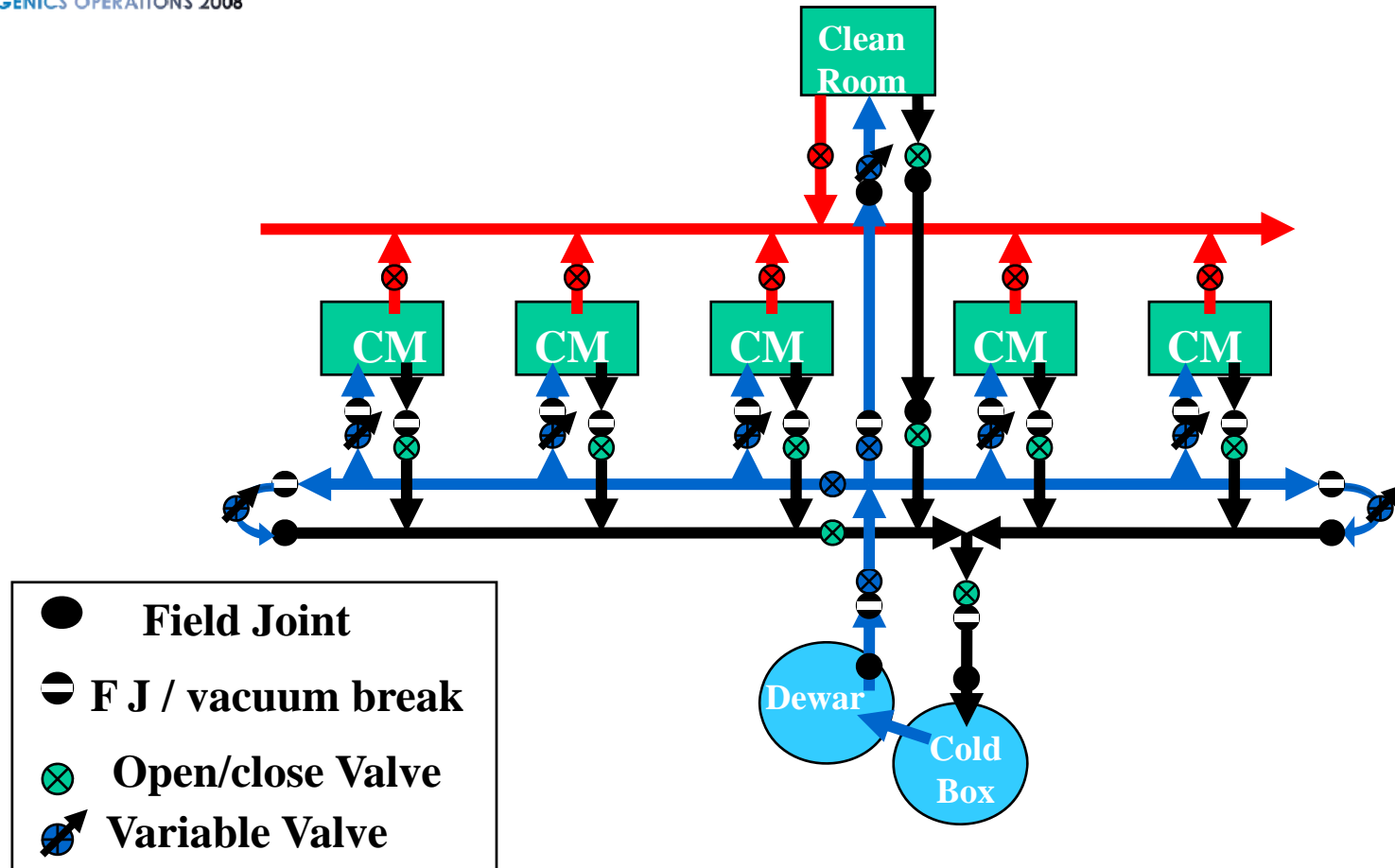
X Second Warm-up

- Remove CM4 to clean room for repair of helium leak in inium seal
- Replace two turbo-pumps in situ



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He Distribution System Phase-I



Parallel supply feed from dewar through main header (4.5K)

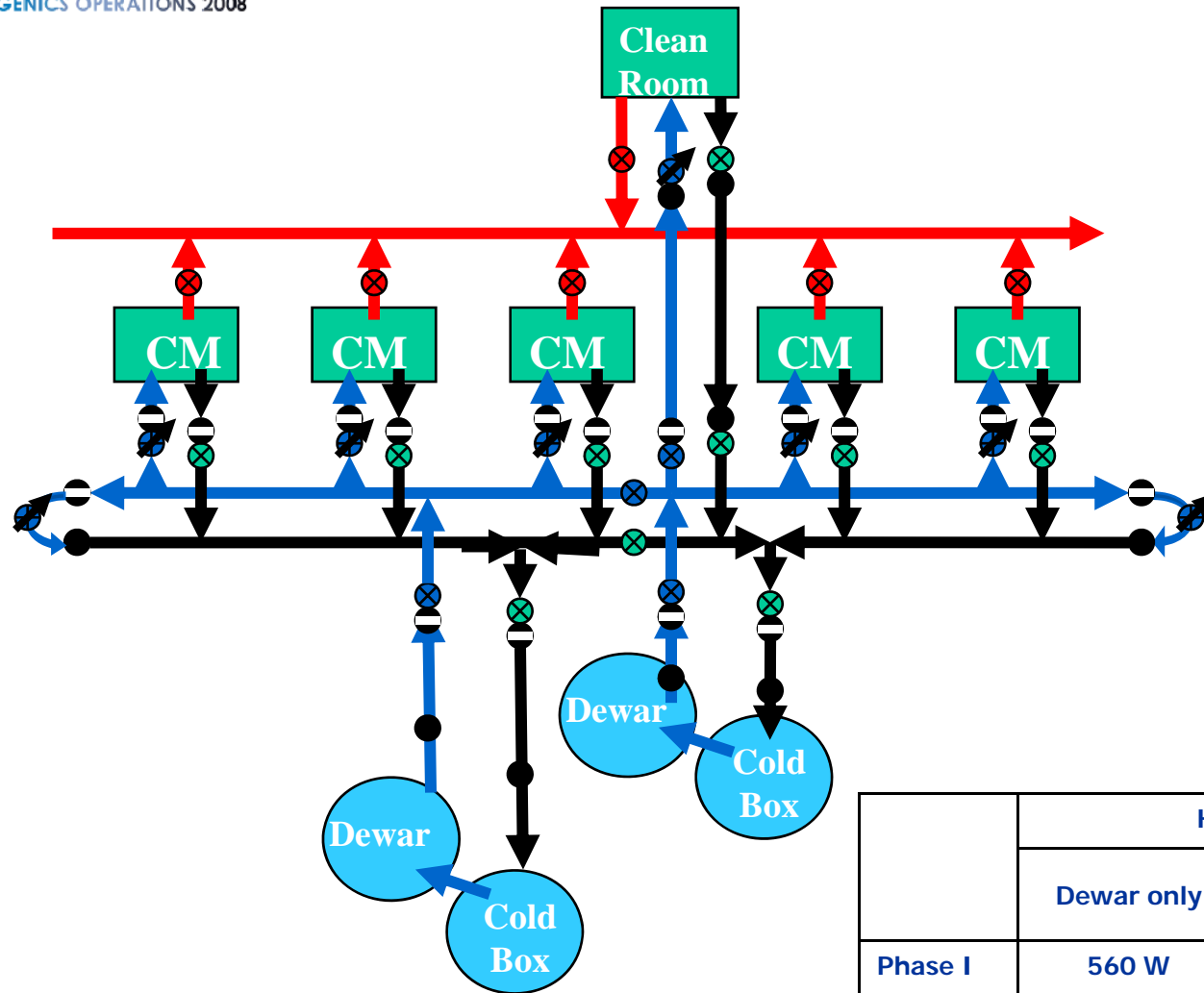
Cold helium return (<30K) during normal operation

Warm helium return (>30K) to compressor suction, used during cooldown



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He Distribution with Phase-I Cryoplant Installed



	Heater Power		Difference
	Dewar only	Dewar + Helium Distribution System	
Phase I	560 W	515 W	45 W
Phase II	660 W	610 W	50 W



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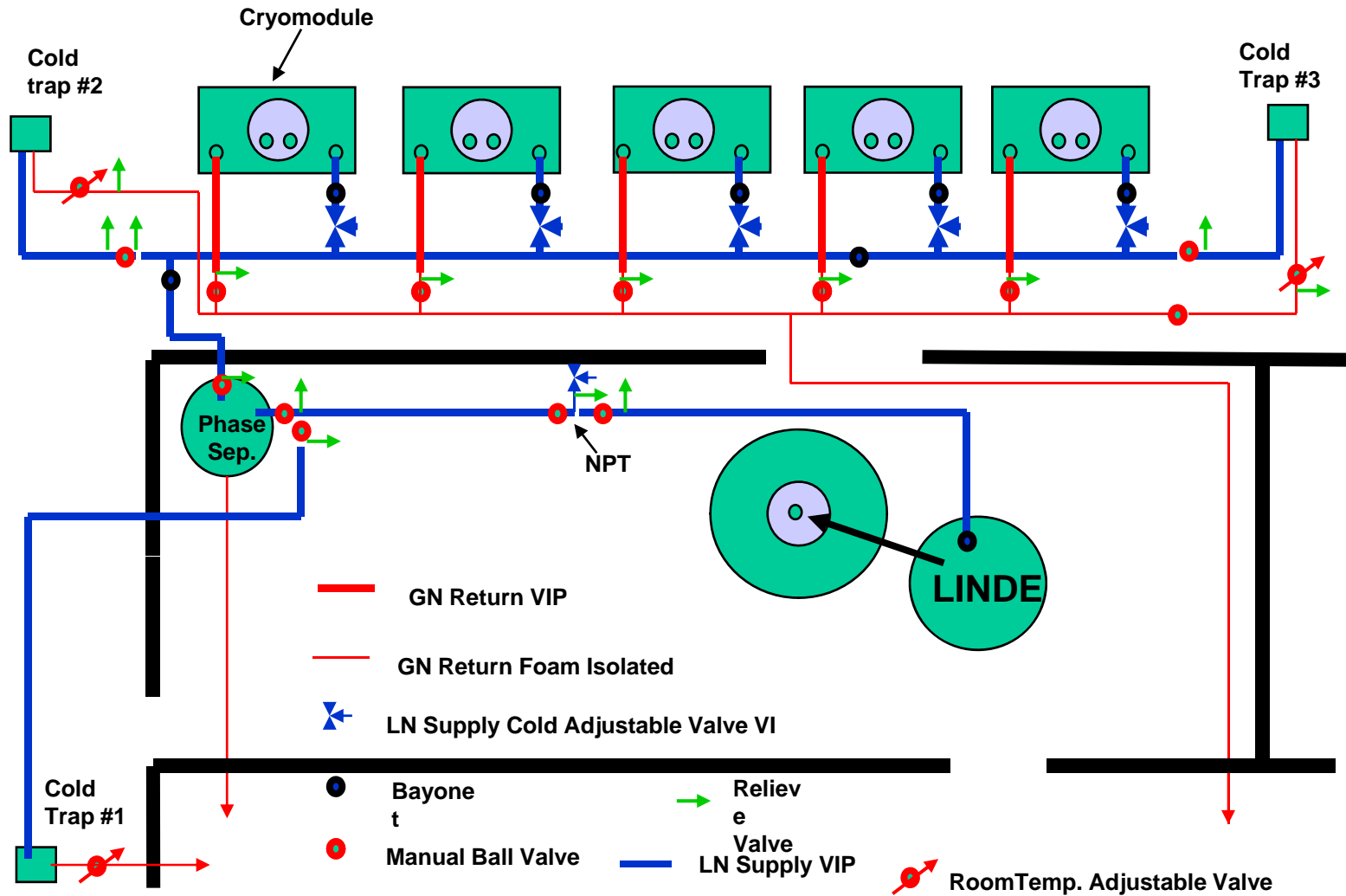
Phase-I & Phase-II





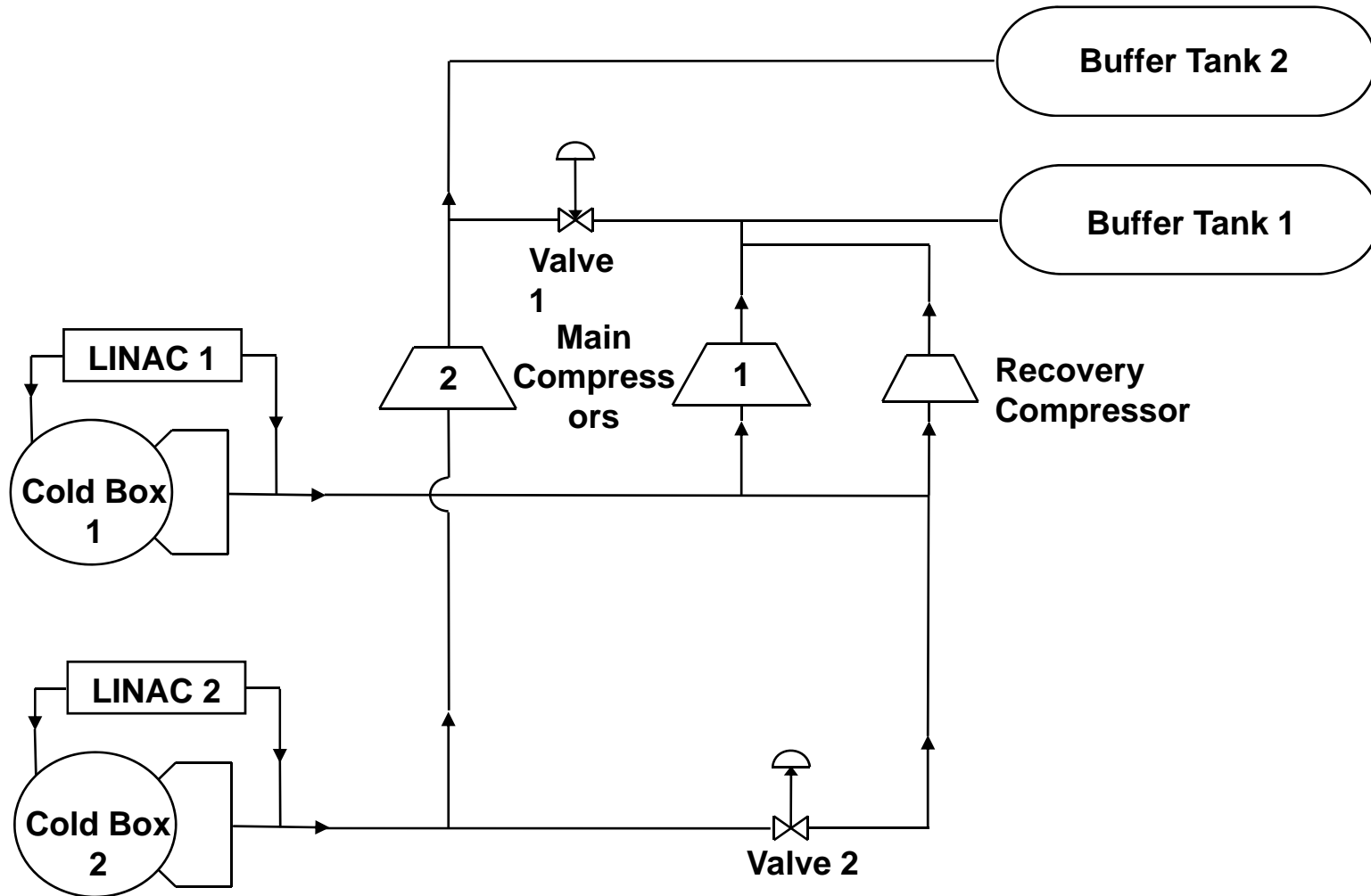
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ISAC Nitrogen Distribution System





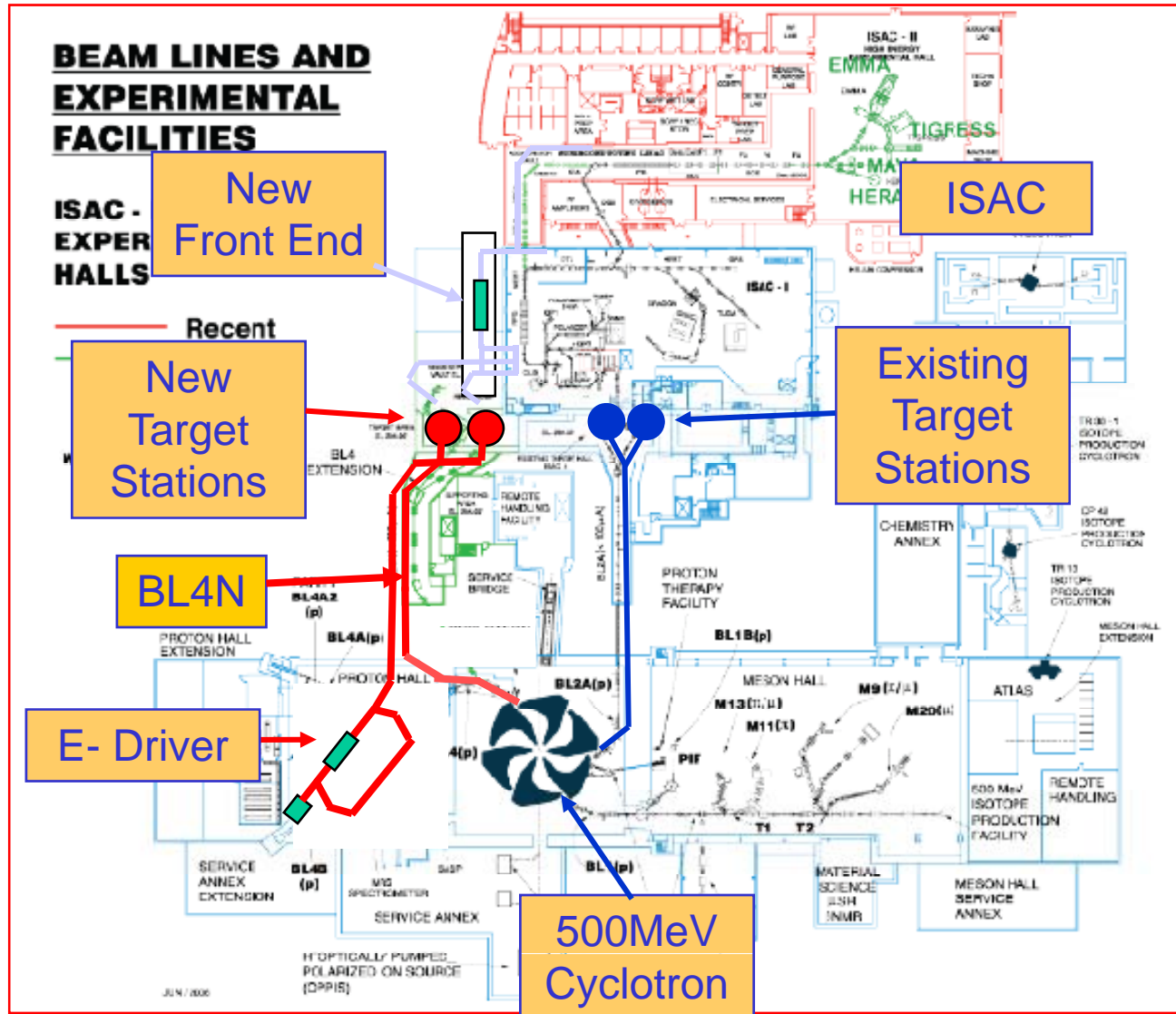
Phase-I & Phase-II Refrigeration System





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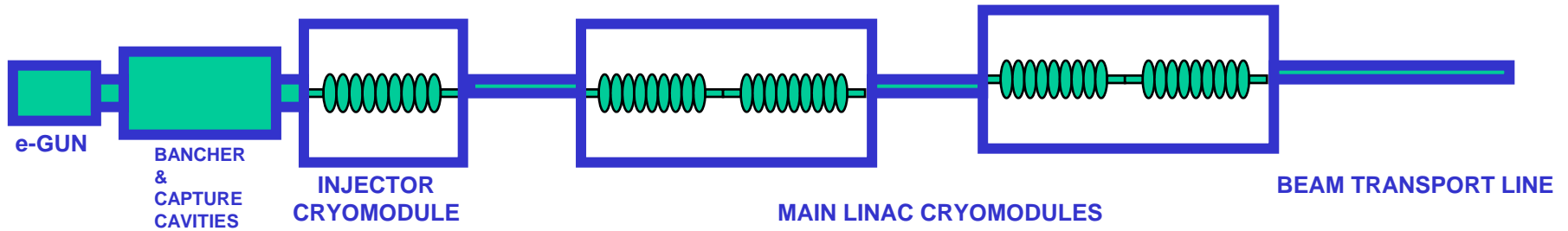
TRIUMF/ISAC Five Year Plan





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e-linac Proposal





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Thank You

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