

AMS Ground Safety Review 02

Cryogenic Ground System Equipment

- System Description

- Cryogenic Ground System Equipment at CERN

- Cool down 300 K – 80 K
 - Cool down 80 K – 4.2 K
 - Cool down 4.2 K – 1.8 K

- Set up at KSC

- Cryogenic Ground System Equipment at SSPF and PCR

- Refill Master Dewar
 - Refill Magnet
 - Magnet steady at 1.8 K

- Control System

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CGSE Items

- The CGSE consists of
 - Valve Boxes (2)
 - Cryostat
 - Control System
 - Compressor Assembly
 - Roots Pumps (2)
 - L-He Transfer and Master Dewar
- A complete series of tests is performed at CERN using the CGSE with a Simulator that is cooled down to 1.8 K prior to connection of the AMS Magnet

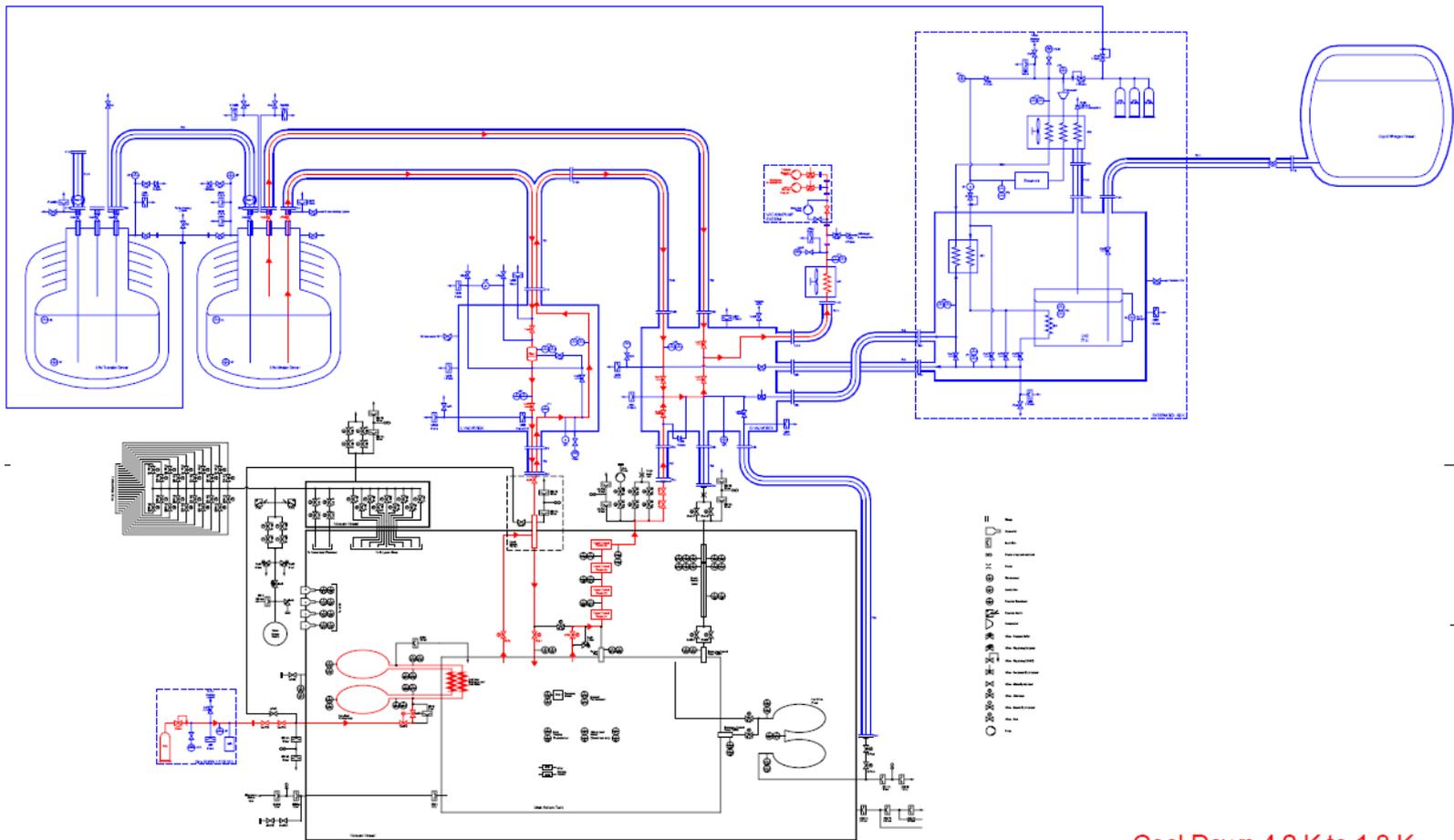
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CGSE Parameters

Parameter	Value
Cold Mass	2000 kg
Temperature Range	300 K - 1.8 K
Max. allowed Temperature Gradient at Magnet	50 K
Volume of He Vessel	2500 l
Maximum Pressure in He Vessel	0.16 MPa
Cool down Time from 4.2 K to 1.8 K	2 d
Flow Rate of He II during Refill	40 - 100 l/h

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Cool down 4.2 K – 1.8 K (possible at KSC)



Cool Down 4.2 K to 1.8 K

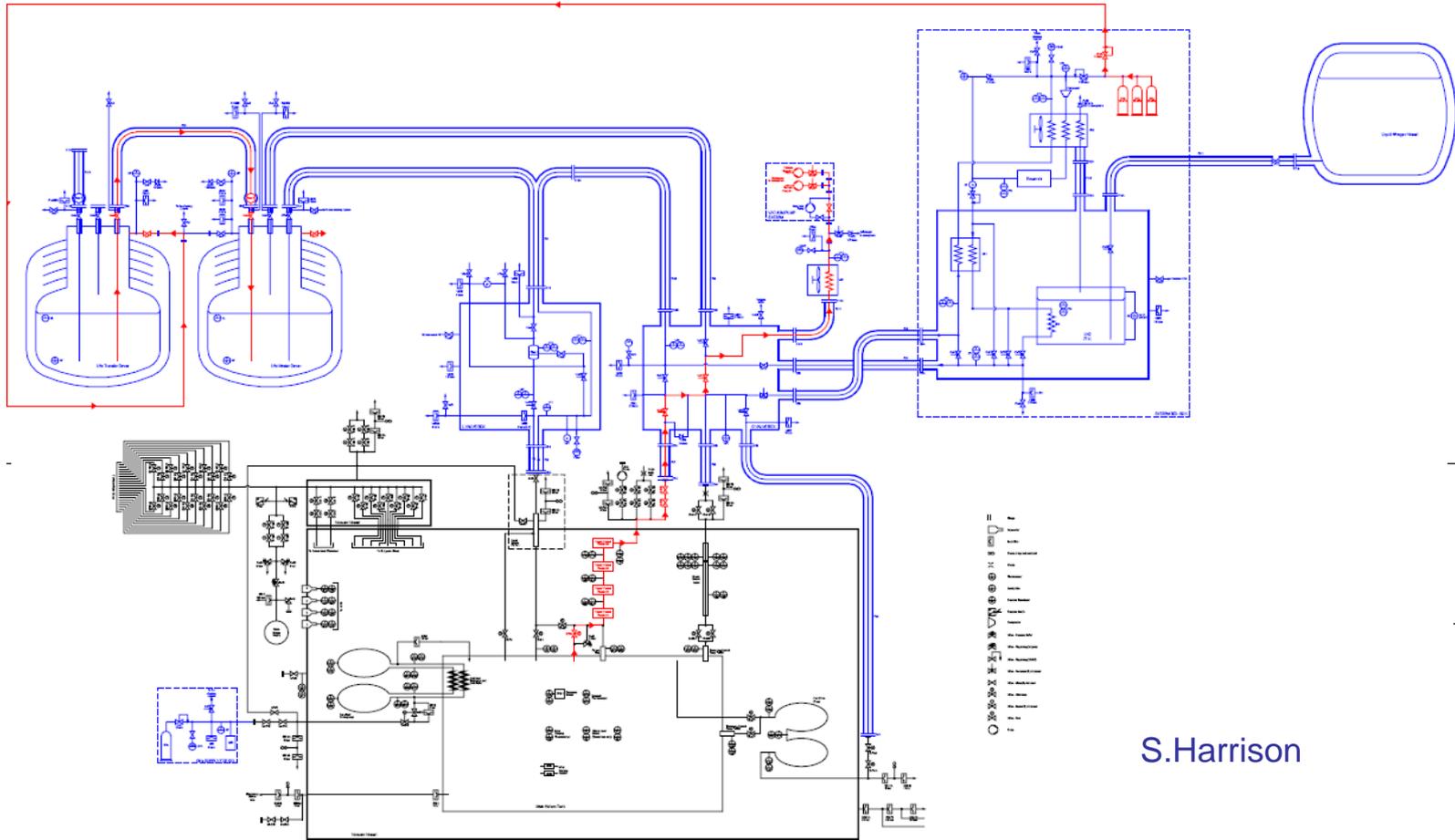
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Operations at KSC

- SSPF (Clean Area)
 - Refill Master Dewar
 - Refill Magnet
 - Keep Magnet at steady State 1.8 K
- PCR (Launch Pad)
 - Refill Magnet at PCR (Launch Pad)
 - Keep Magnet at steady State 1.8 K at PCR

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Refill Master Dewar (possible at KSC)

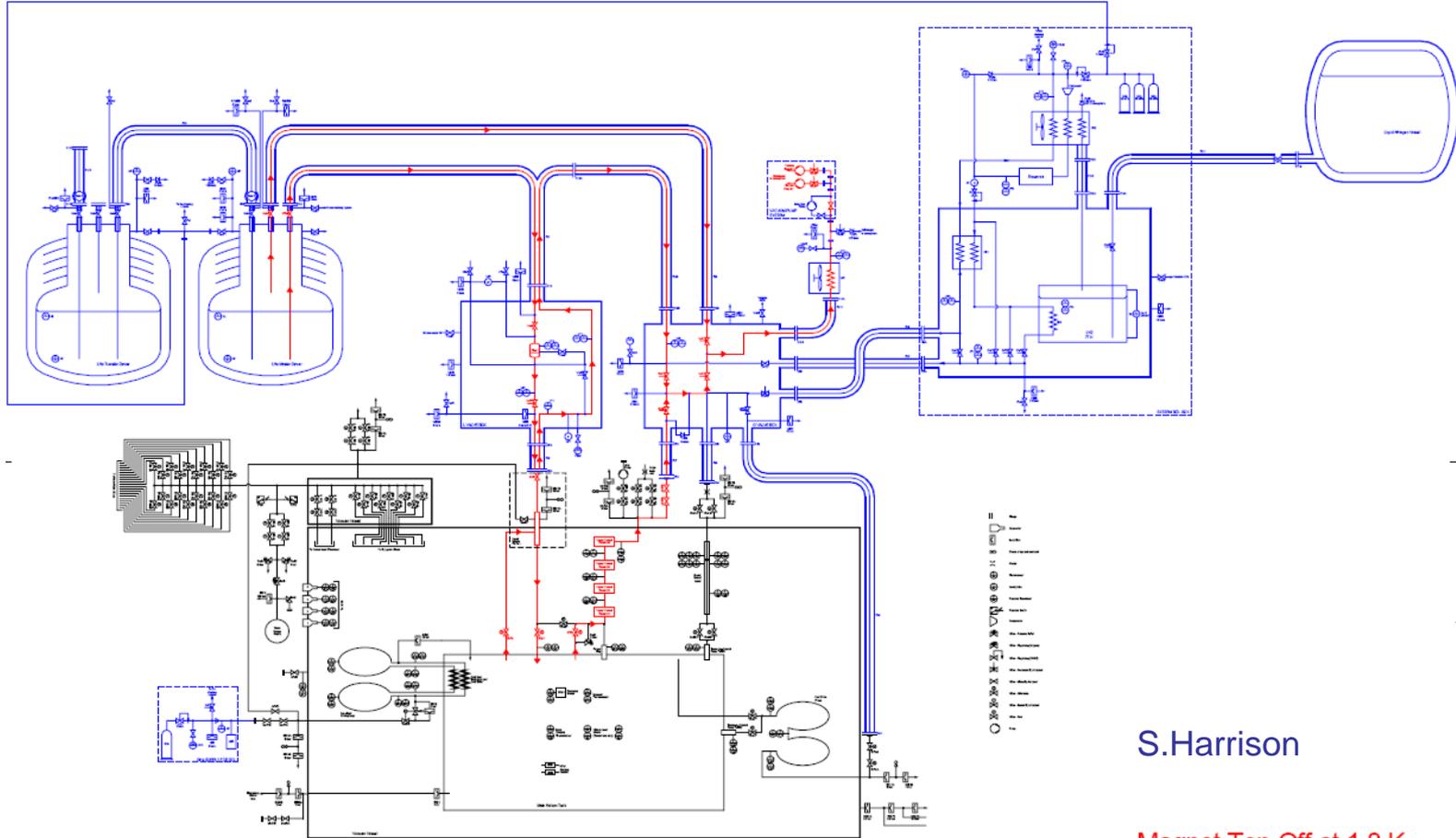


S.Harrison

Filling the master dewar with the magnet at 1.8 K

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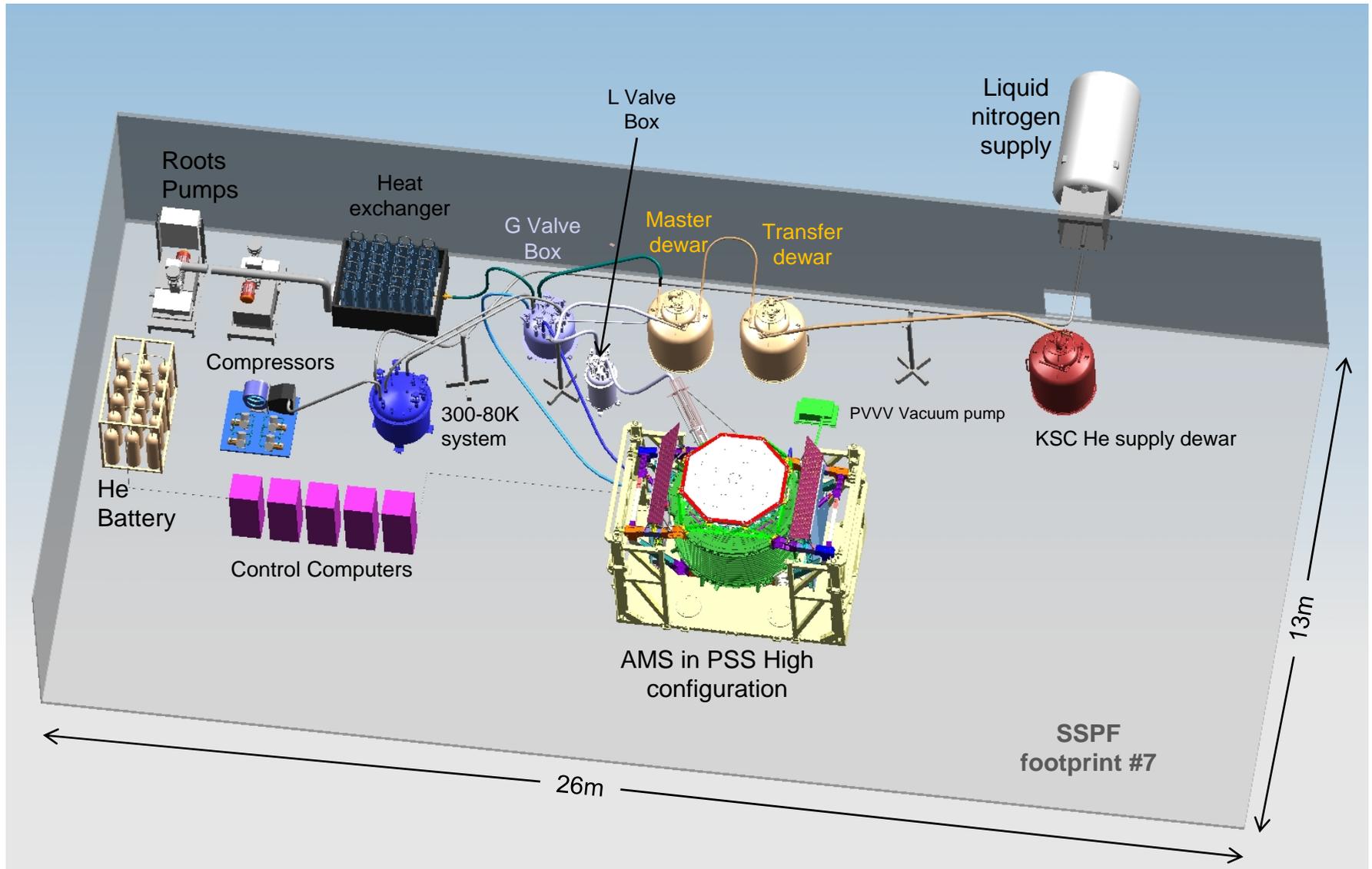
Refill Magnet at 1.8 K (possible at KSC)



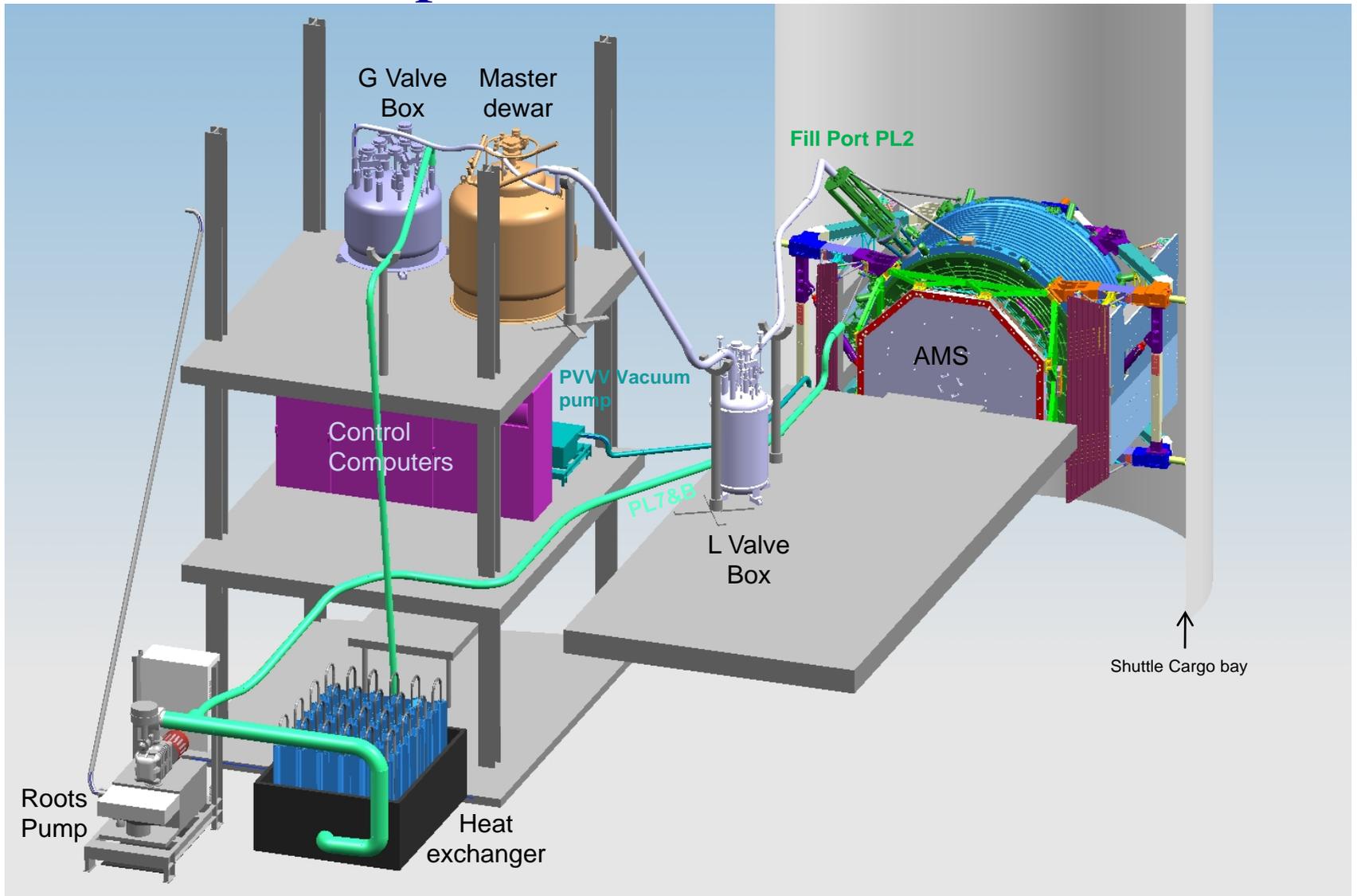
S.Harrison

Magnet Top Off at 1.8 K

CGSE Set up in SSPF at KSC



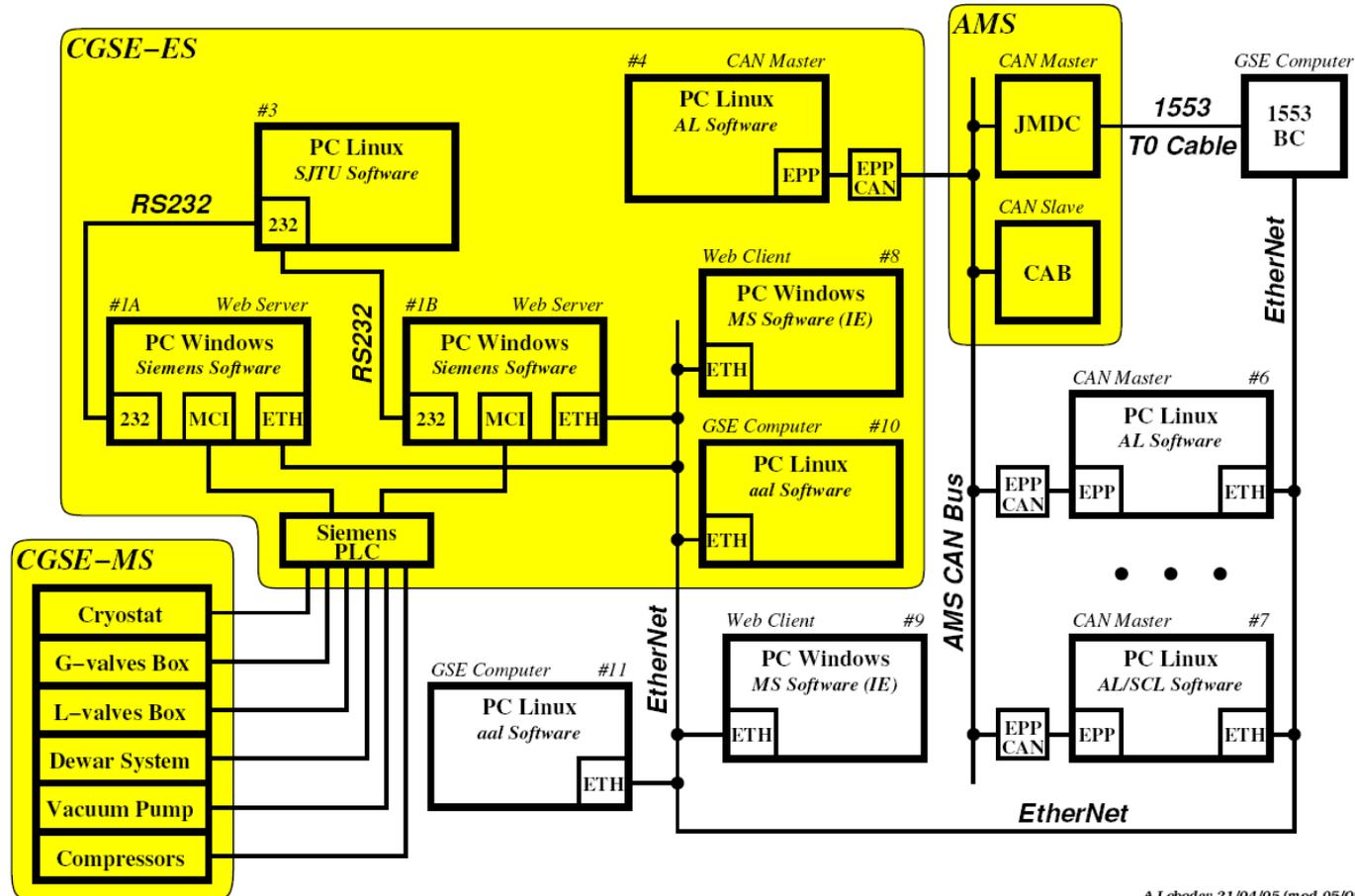
Set up on Launch Pad at KSC



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CGSE Control System

CGSE: Monitoring and Control General Scheme (1)



A.Lebedev 21/04/05 (mod.05/08/08)

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Control System



08/02/2008

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12

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Safety

- All Items of the CGSE will be leak and pressure tested before operation at CERN.
- Valve Boxes, Cryostat and Simulator are equipped with adequate Burst Disks.
- The CGSE with Simulator connected will be thoroughly tested at CERN in September-October.
- The Control System will be thoroughly checked.
- The CGSE will be operated in all modes discussed in this presentation. Results will be made available.