Status of DFA + link to Q6 in point 7

Délio Ramos, WP6 meeting, 5.3.2014

Outline

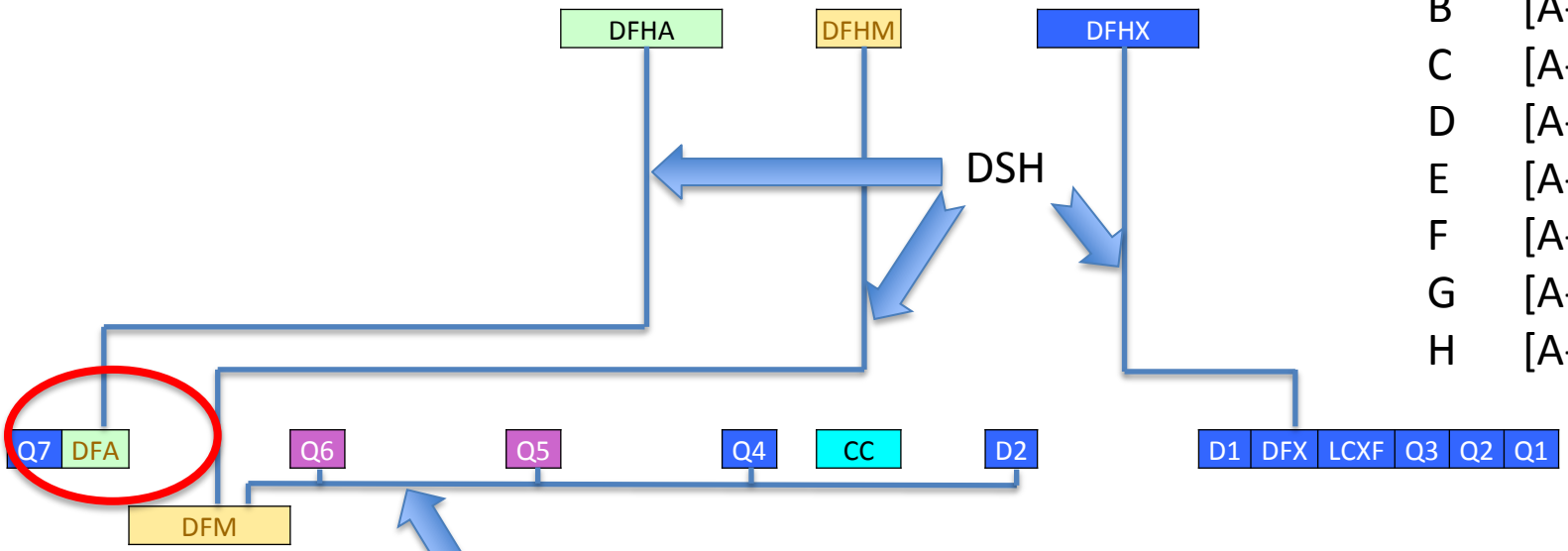
- Naming
- Visit to point 7
- Base concept and approach
- Time scale

Sami Chemli

Naming Proposal

DFHA	[A-H] (or [A-P]?)
DFHM	idem
DFHX	[A-D]

DSH A	[A-F]
B	[A-F]
C	[A-B]
D	[A-D]
E	[A-F]
F	[A-D]
G	[A-B]
H	[A-F]



DSL (as today, extended for D2?)

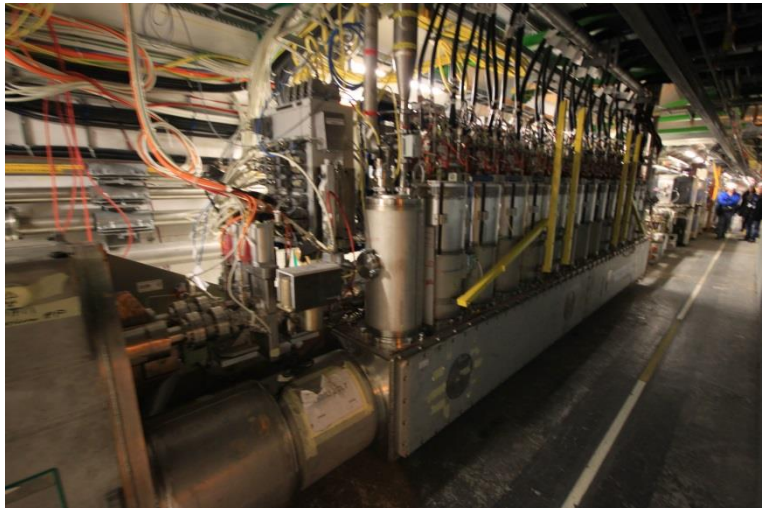
In point 7 the DFM function may be integrated into the DFA

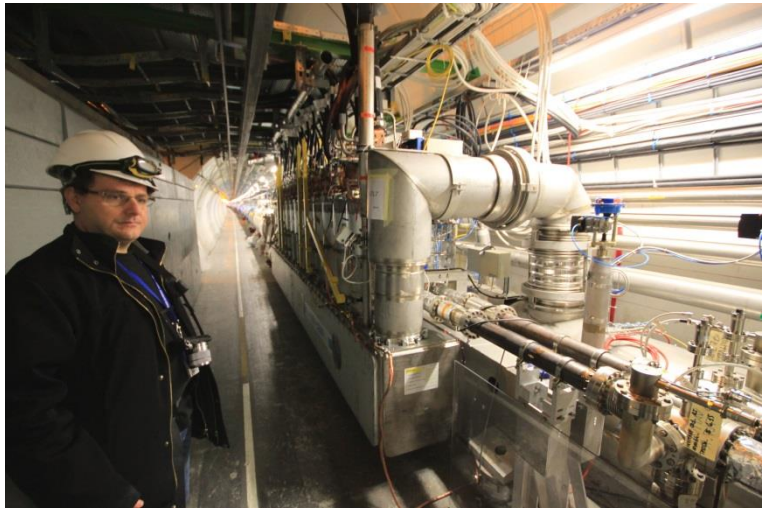
DFA	[A-P]
DFM	[A-P]
DFX	[A-H]

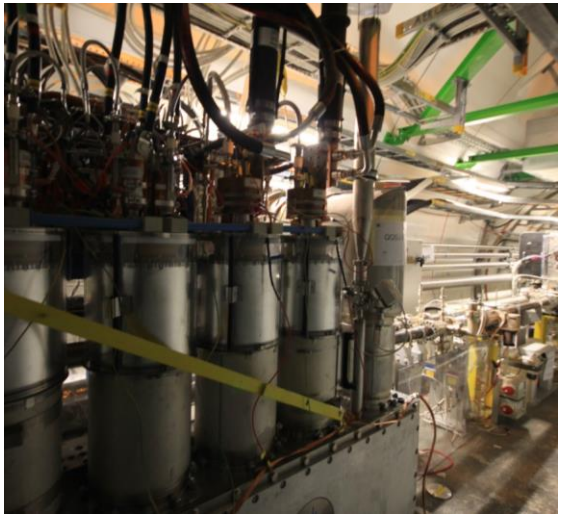
Point 7 Left

Site visit organised by J-P Corso, 26.11.2013

DFBA



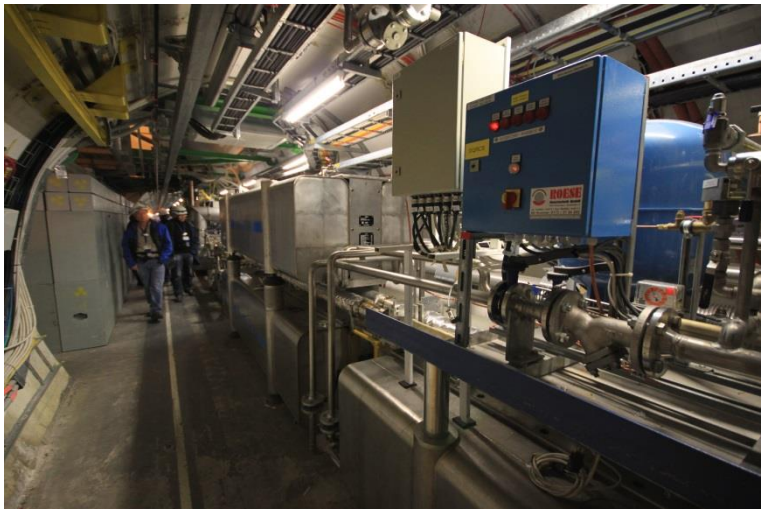


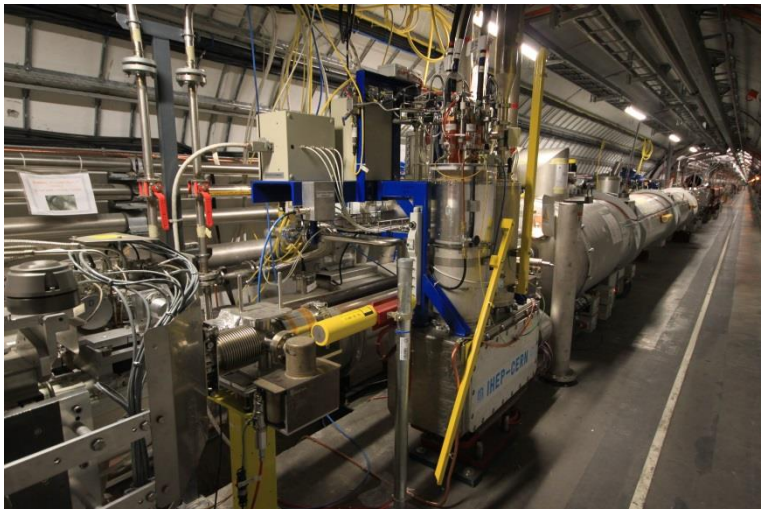


Point 7 Left

Site visit organised by J-P Corso, 26.11.2013

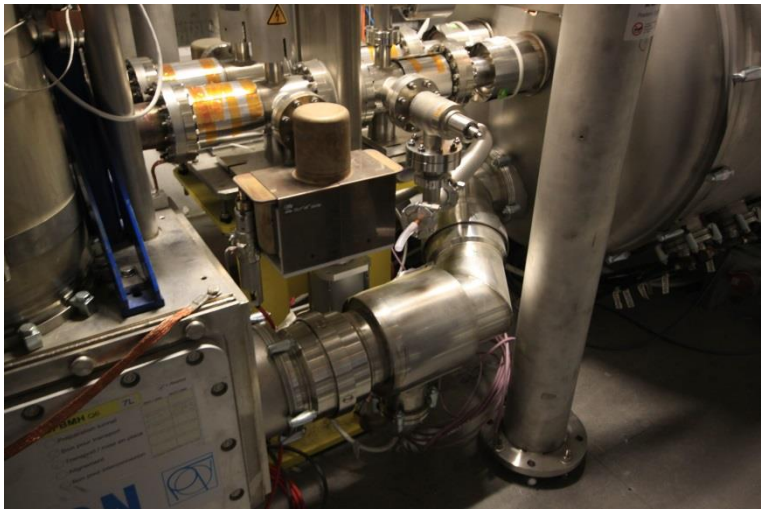
Resistors





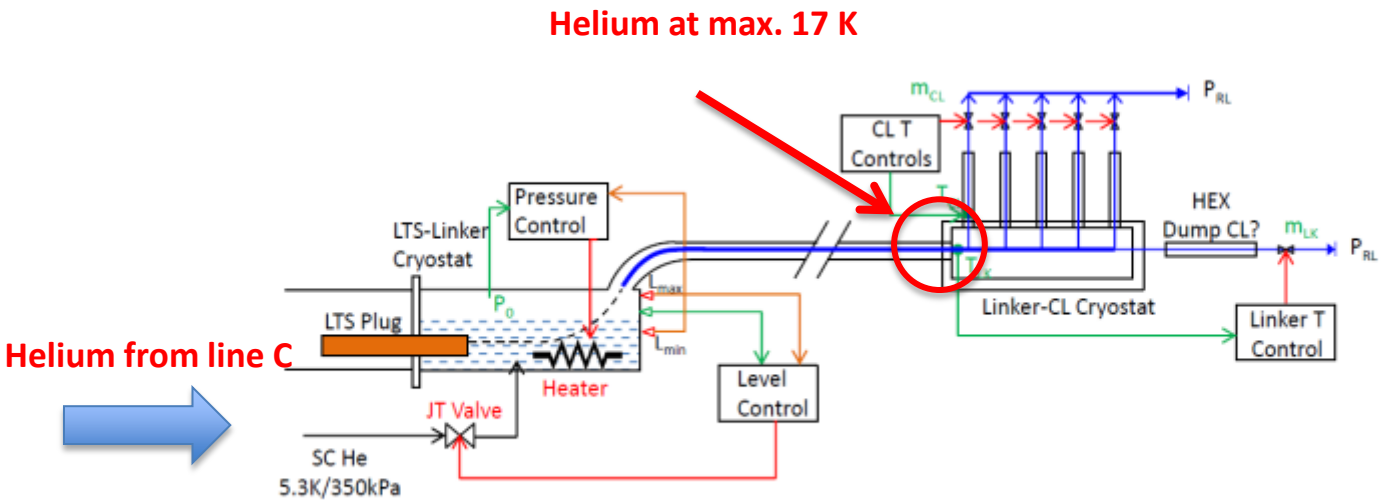
DFBM

Shielding



Short link DFBM-Q6

Current Base concept (all sites)

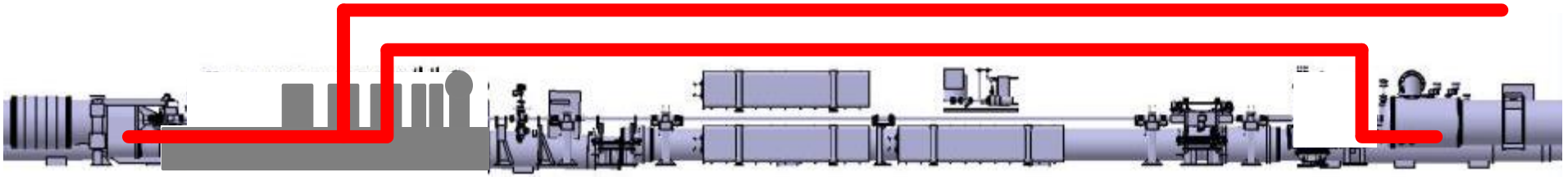


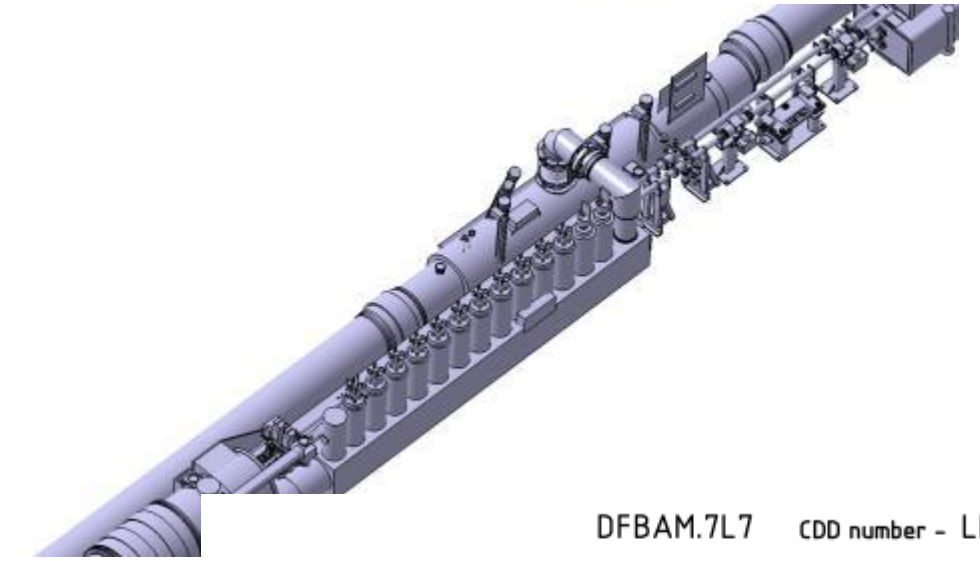
- The 17 K limit for the MgB_2 link allows only the 5 K, 3.5 bar helium from line C as coolant.
- The link will be cooled by helium gas created by evaporating the liquid helium in the spice box.
- Thermal shield solution not shown.
  - Either with 20 K, or with 70 K gas.

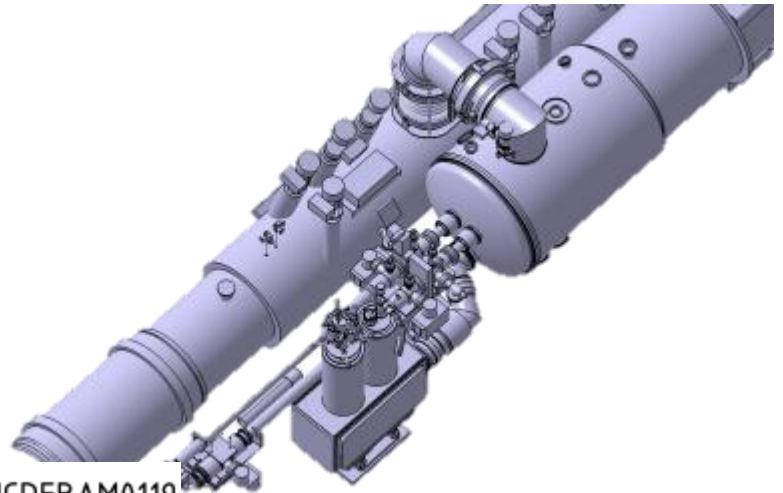
Minimum change approach

- Minimise work in the tunnel
  - Assemble and test before LS2 starts
  - Aim for installation within short time slot (radiation cooldown time may be long..)
- Remove HCM only and replace with DFA
  - Keep 2x13 kA leads in current position
  - Keep cryo jumper in current position
  - Vertical link connection
  - Keep existing support beam and shuffling module
- Remove DFBMH and link Q6 to DFA
  - Possibly with no changes to Q6 QQS and jumper
  - Link routed above QRL

Point 7 Left

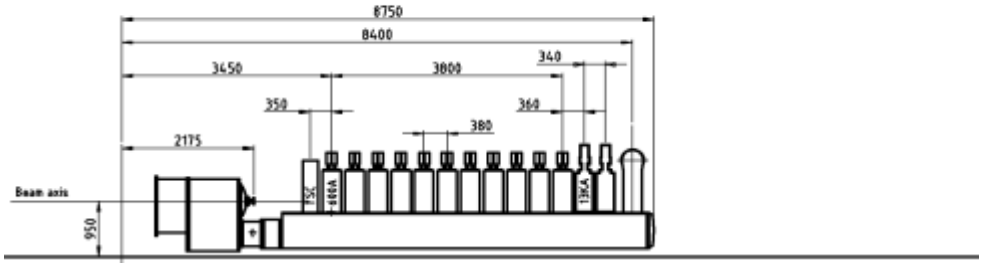




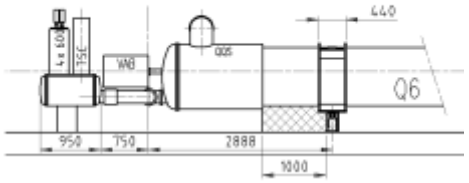


DFBAM.7L7 CDD number - LHCDFBAM0119

LHCDFBM_0003



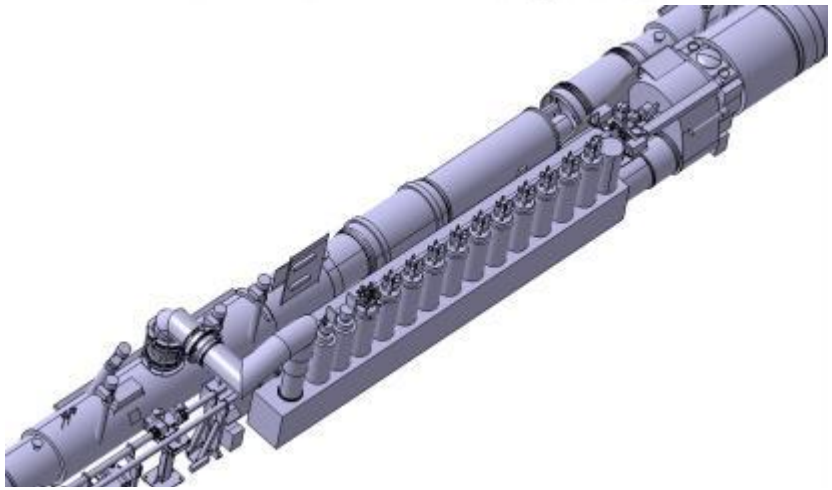
DFBMH.6R7



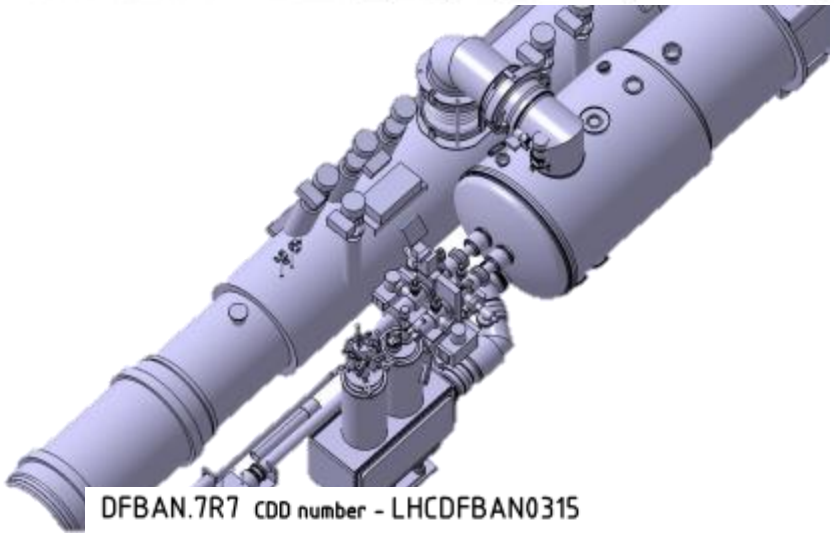
LHCDFBA_0010

Point 7 Right

ST0296494_07



DFBMH.6L7



DFBAN.7R7 CDD number - LHCDFBAN0315

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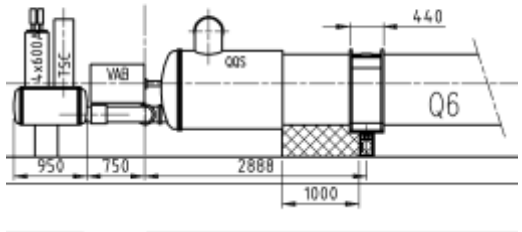
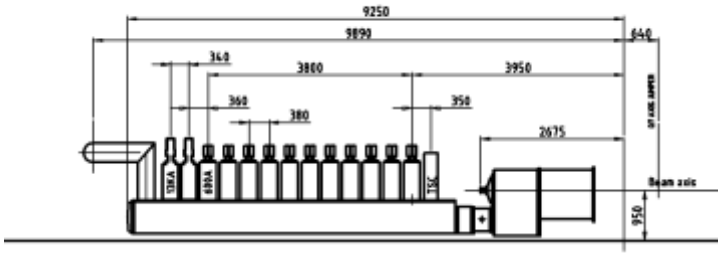
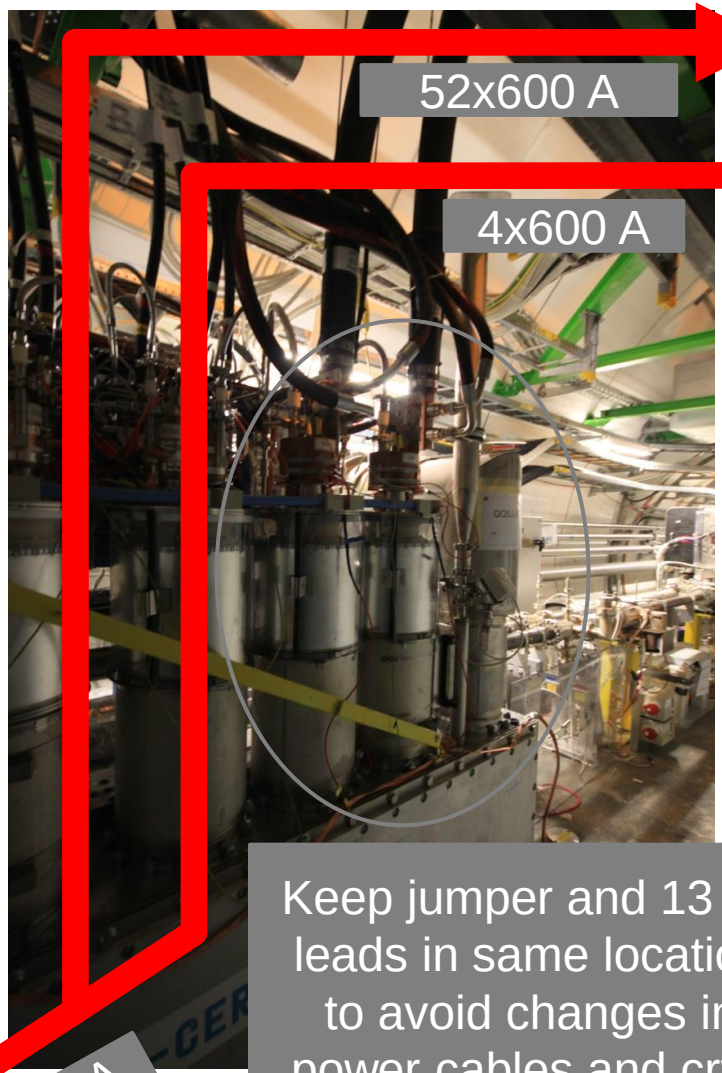


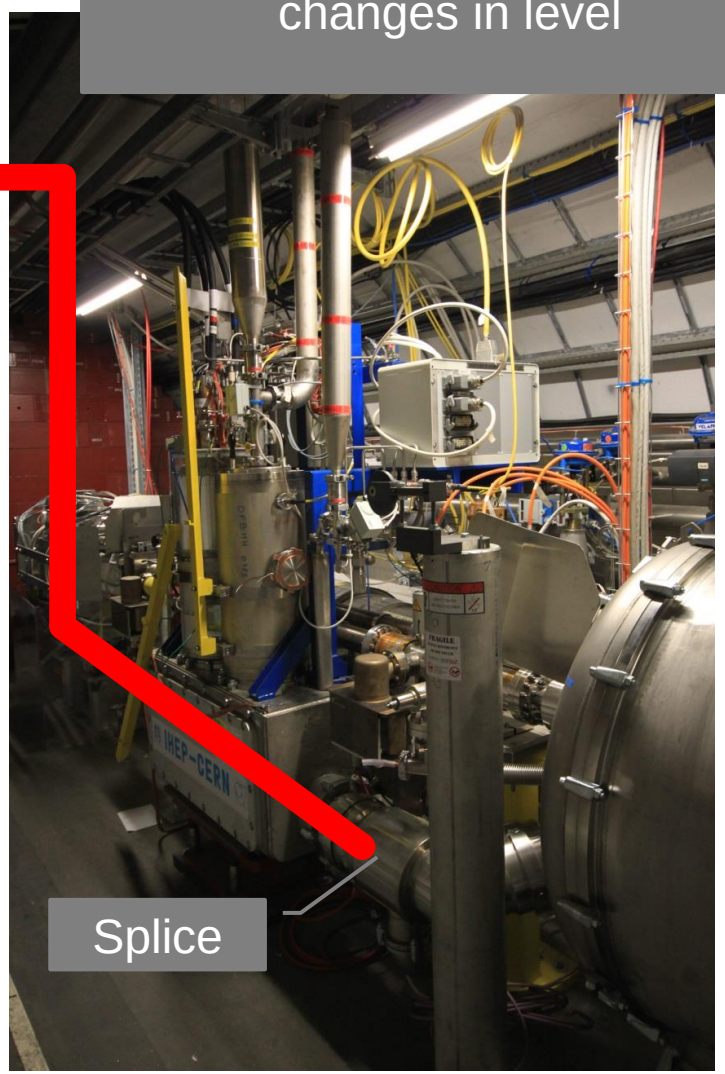


LHCDFBA_0010

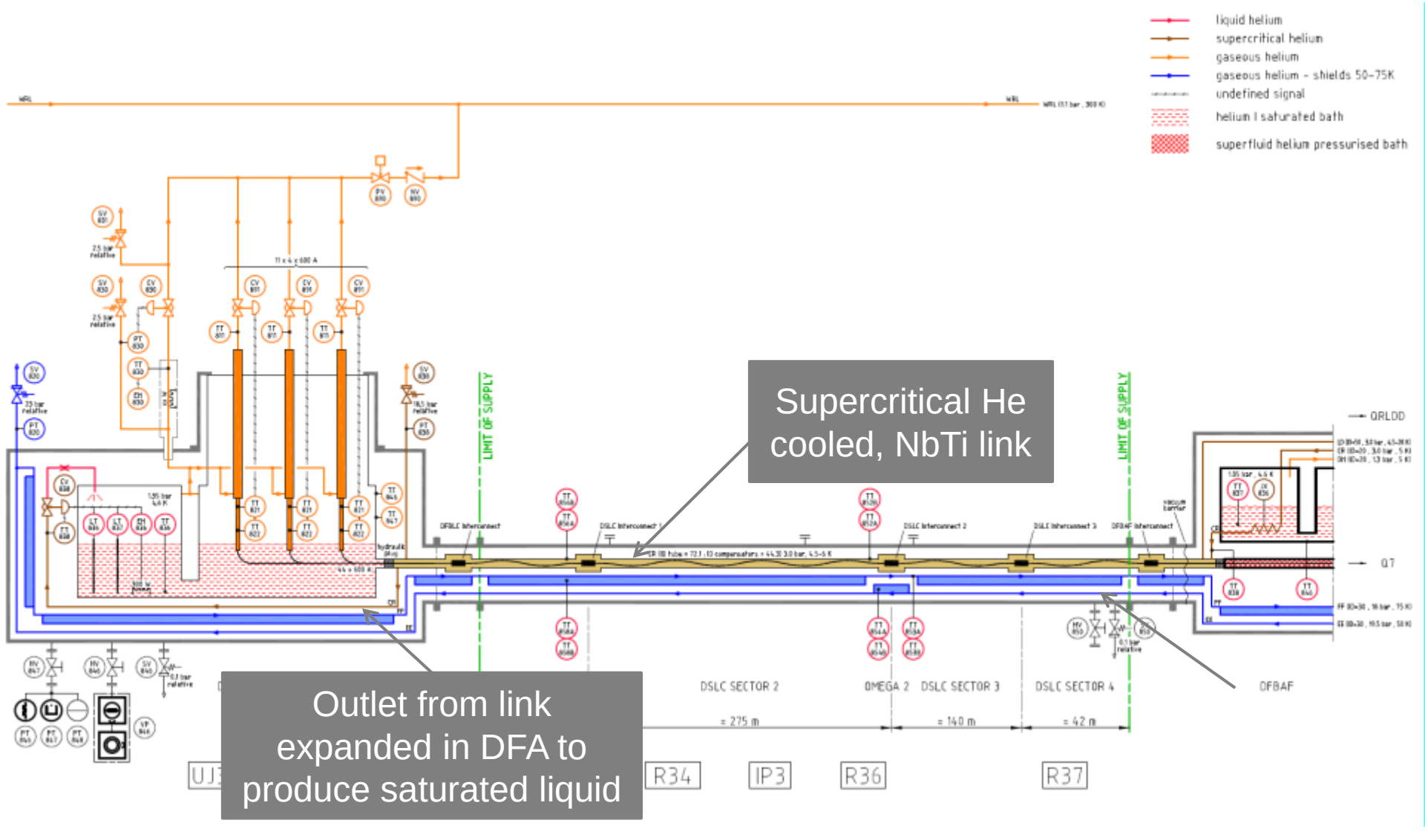
DFA to Q6 in NbTi
Supercritical He because of changes in level



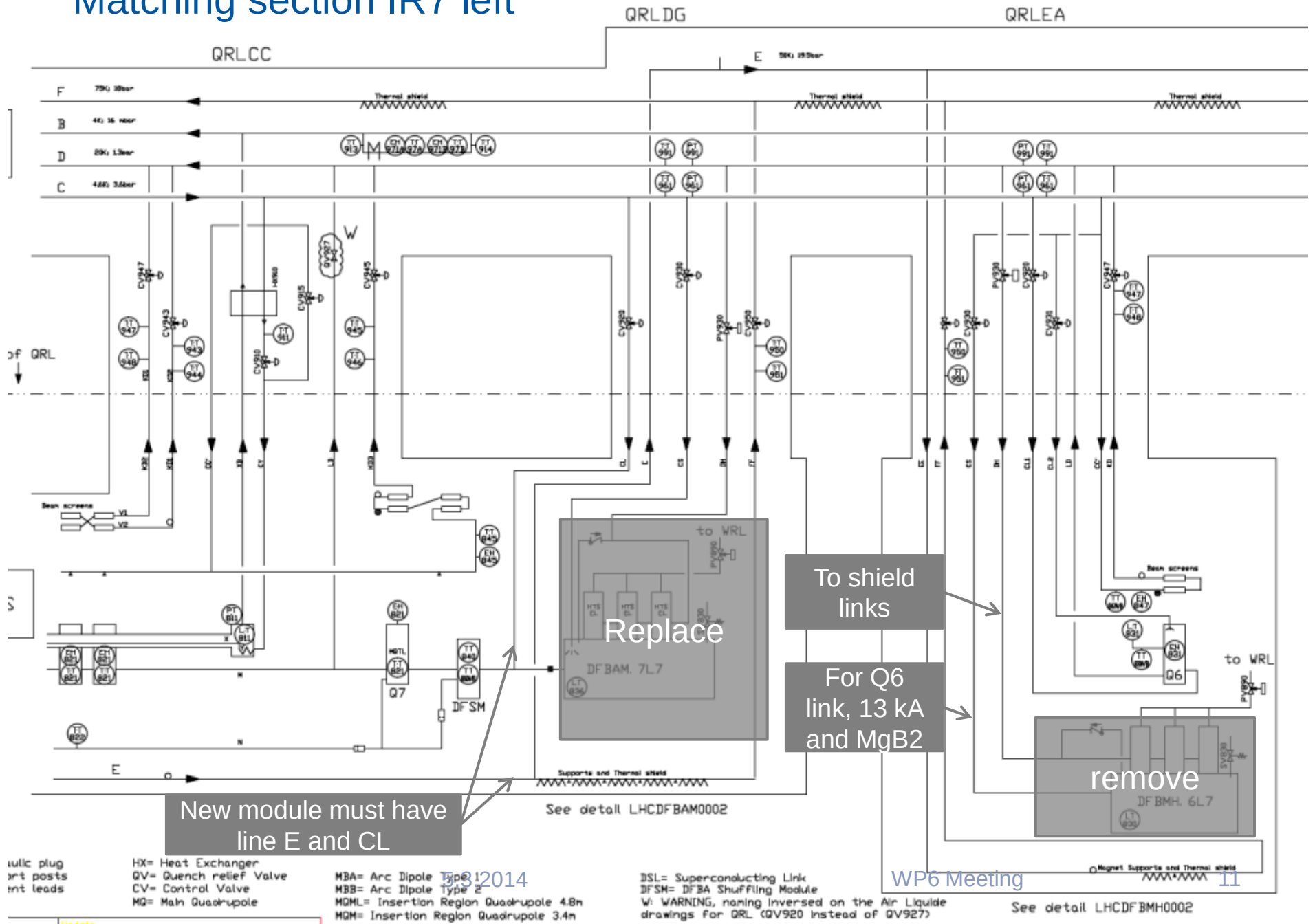
Keep jumper and 13 kA leads in same location to avoid changes in power cables and cryo distribution



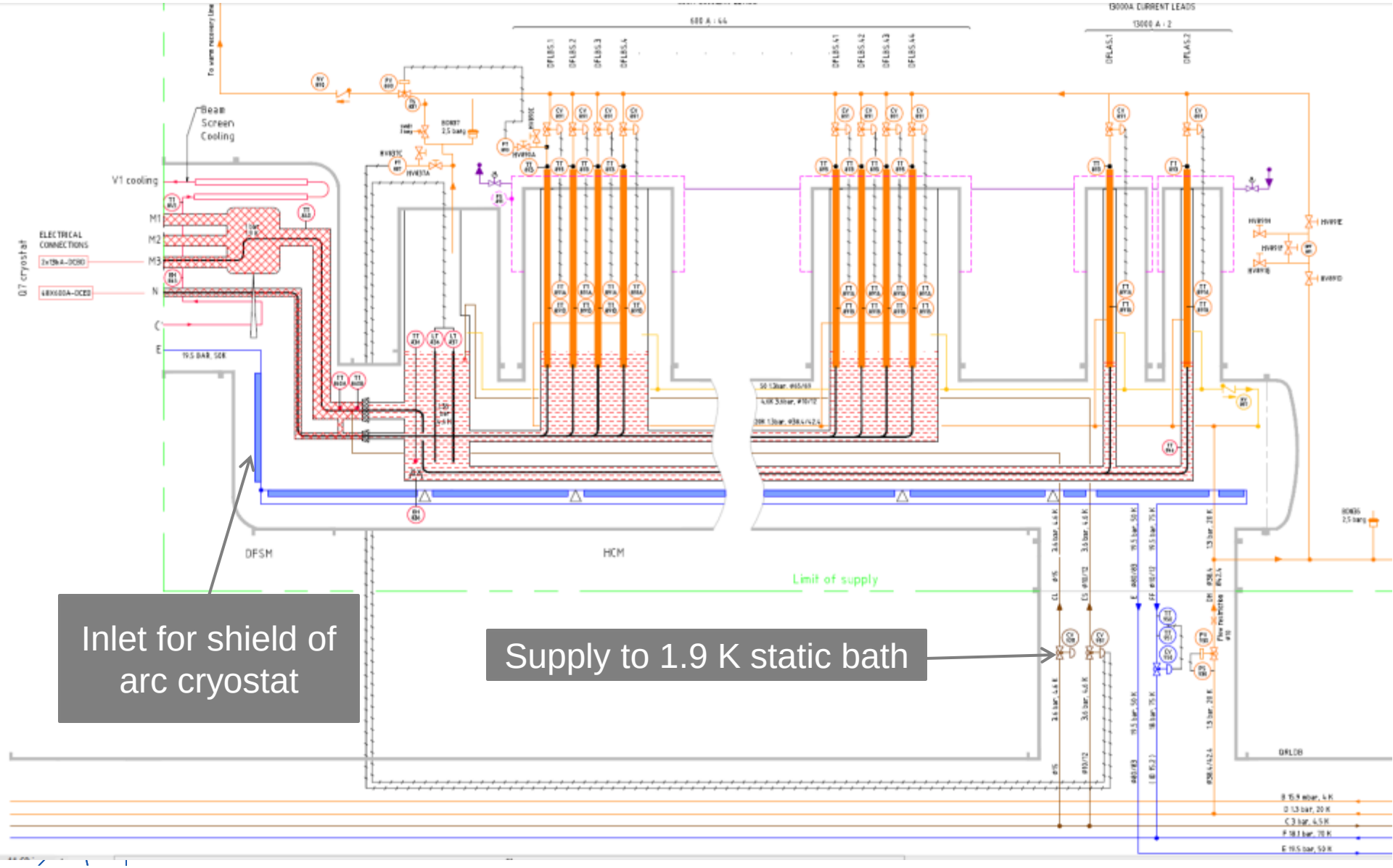
Implementing a DSL inspired solution for the link to Q6



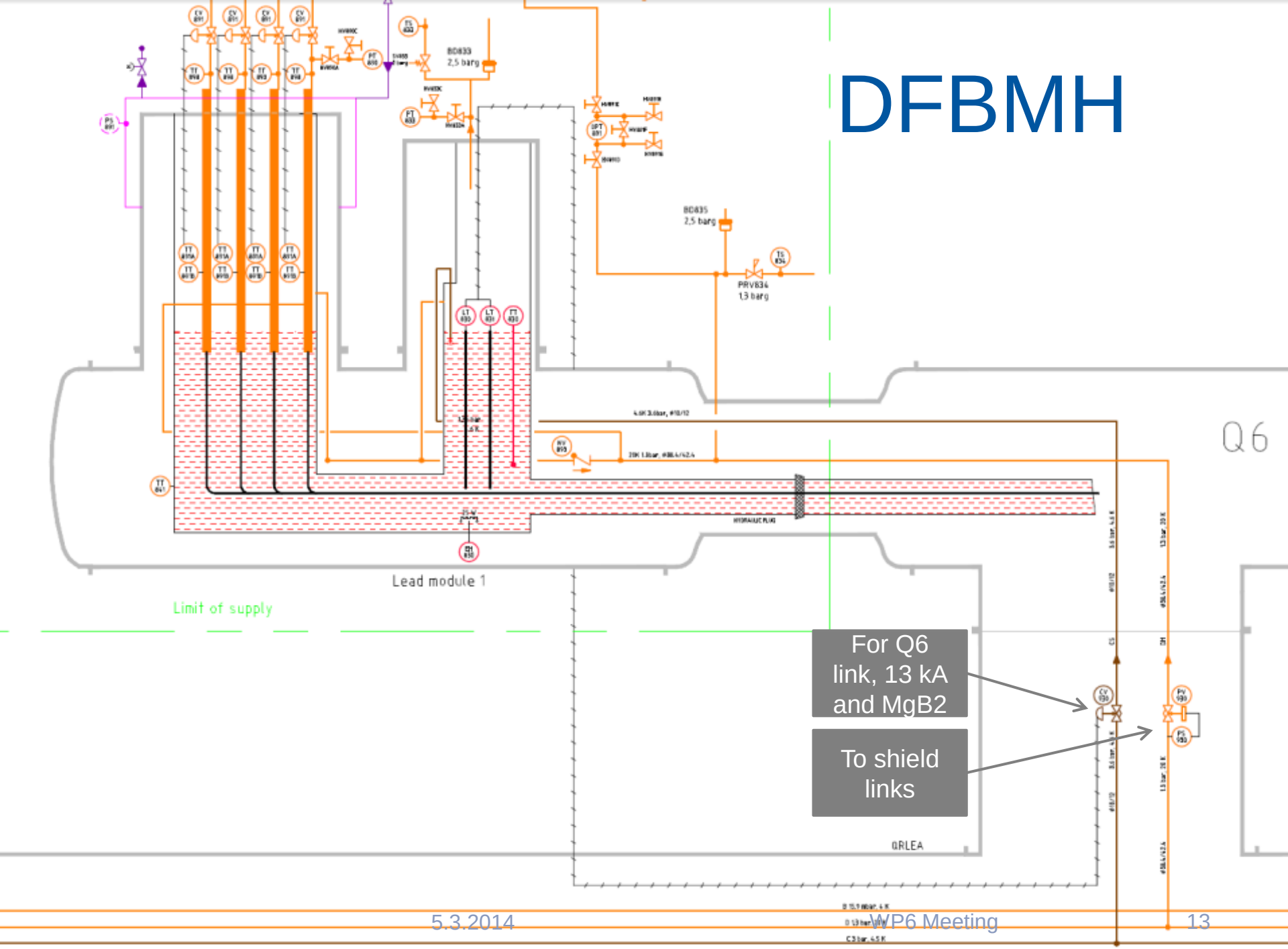
Matching section IR7 left



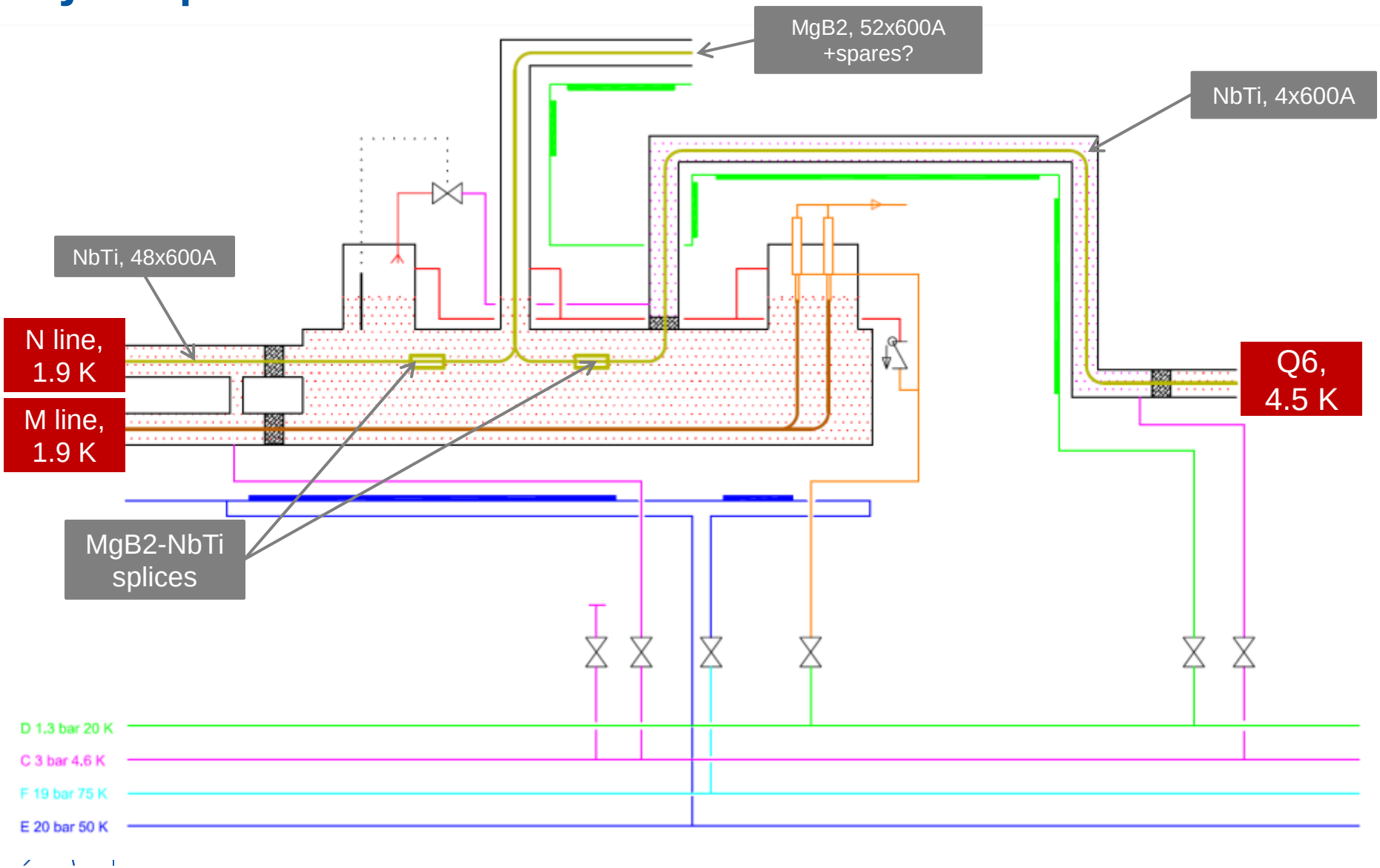
DFBAM 7 Left


Beam Screen Cooling
V1 cooling
M1
M2
M3
N
C
E
ELECTRICAL CONNECTIONS
Q7 cryostat
DFSM
HCM
Limit of supply
Inlet for shield of arc cryostat
Supply to 1.9 K static bath

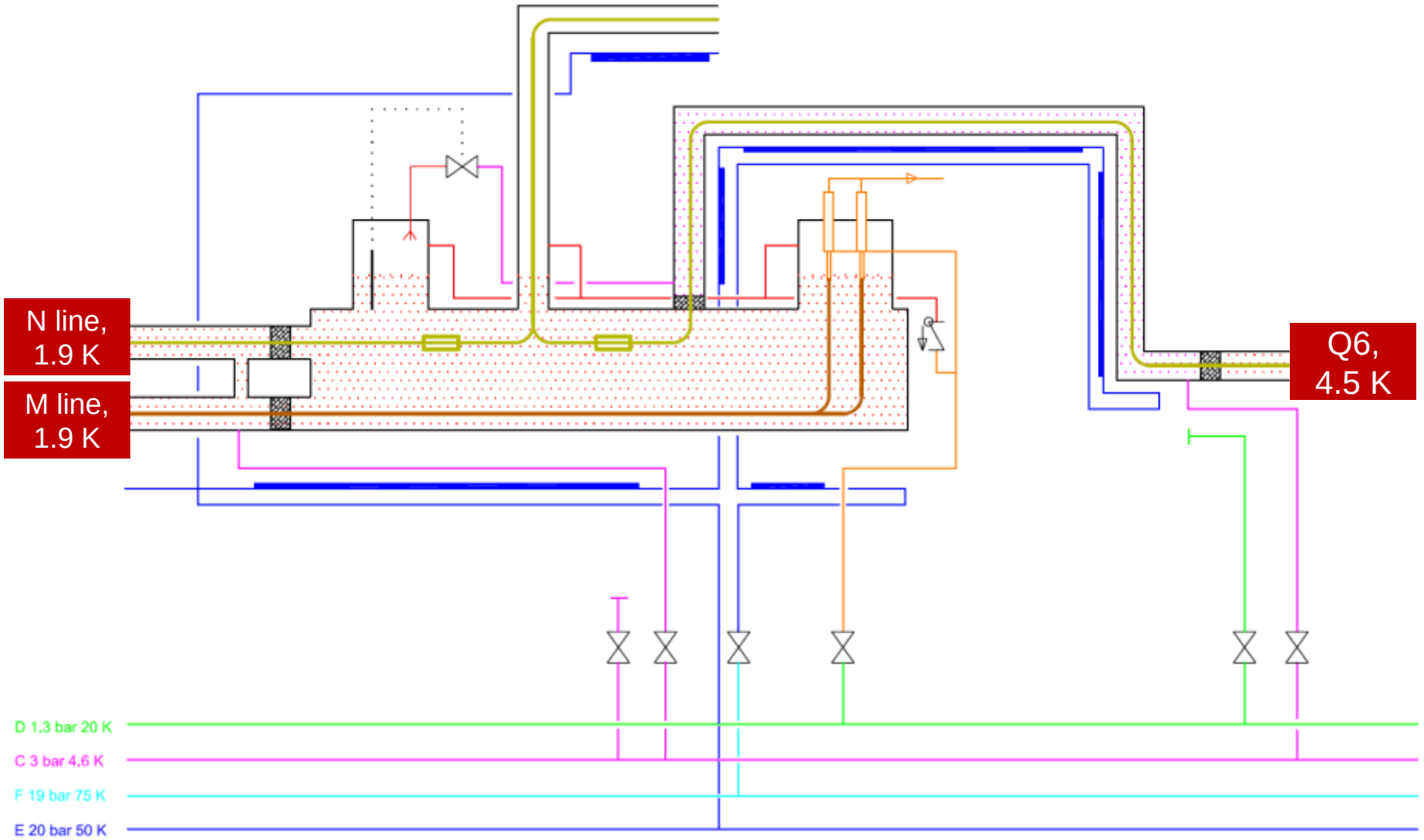
DFBMH


BD833
2,5 barg
BD835
2,5 barg
PRV834
1,3 barg
Q6
Lead module 1
Limit of supply
For Q6 link, 13 kA and MgB2
To shield links
QRLEA

Link shield 20 K inlet with existing jumpers and valves



Link shield 70 K inlet



Typical time scale

- From an established concept to ready for tendering documentation: 1 year (usually more...)
- Tendering: 6 months
- Fabrication: 1 year
- Ready for installation: + 6 months (possibly more if cold tested)
- i.e. 3 years minimum
- We should start now:
  - Agree on the cooling scheme
  - Validate integration in the tunnel (links and DFA)
  - Determine piping dimensions and extent of modifications to QRL and Q6
  - Start the DFA and Q6 link mechanical design


CERN