Q6 at P1/P5
Alternatives 1.9K - 4.5K
Cryogenics point of view

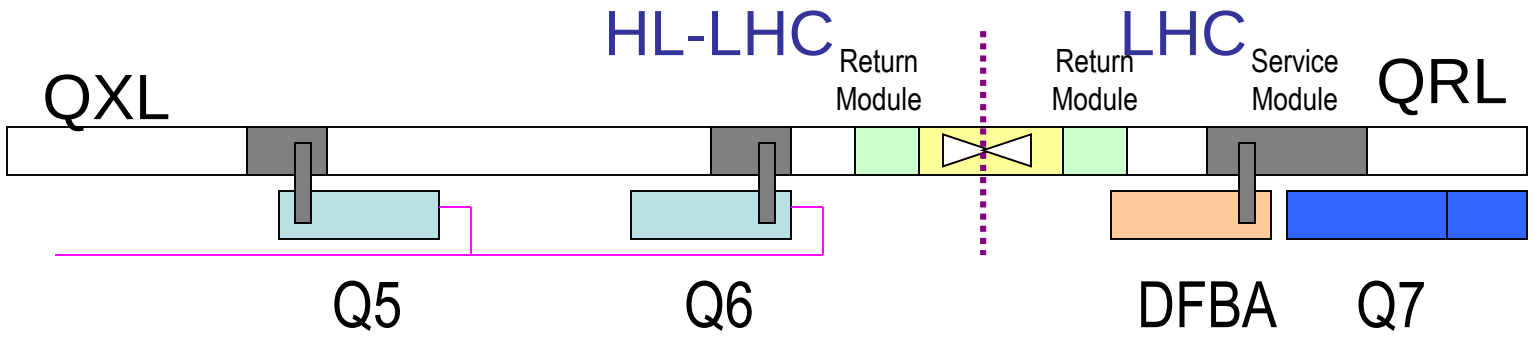
HL-TCC#2, decision taken to consider limit of HL w.r.t LHC between Q6 & Q7
=> Time now to define all together the temperature of Q6

S.Claudet

HL-TCC, 10Mar'16

HL-TCC#2, 11Feb'16

- P. Fessia concluded that the advantages of installing the QRL/QXL connection box in the baseline location appear to be evident, it is therefore proposed to stick to the baseline.
- L. Rossi asked if any implications are expected for the different temperature options. ACTION: a proposal on the operating temperature of Q6 magnets in point 1 and 5 should be presented in one of the next TCC meetings, including cost variations associated to the 1.9 K option (WP3 and WP9). A. Ballarino confirmed that from the magnet point of view the operating temperature is not expected to have any implications. From the cryogenic point of view the use of a conduction heat exchanger should be envisaged.



Temperature:

IT, D1, D2, Q4: 1.9K, pressurised Helium

CC: 1.9K, saturated Helium

Remarks:

Documents found from 2014 considering Q6 @ 4.5K (with mix 1.9K-4.5K since 2013)

And since HL-TC 03Dec'15

⇒ Q1 to D1 @1.9K => BS @40-60K *or equivalent*

⇒ D2 to Q6 @1.9K(Q6@4.5K?) => BS @4.5K-20K

For us, what is said for Q6 would apply for Q5 !

Temperature for Q6@P1/P5

- Cooling principle:
  - 4.5K: as LHC Stand-Alone magnets
  - 1.9K: as now considered to be developed with conduction cooled

  => No new develeopment, 1.9K more comfortable (obvious wetting of conductors)
- Investment costs:

  => No big difference at this stage for Cryo (maybe 4x25kCHF more for 1.9K)
- Operation costs:
  - About 5kCHF/yr/Magnet => 200kCHF for HL (4 magnets) over 10 years
- Operation feedback:
  - Easy commissioning and helium management at 1.9K, feasible at 4.5K

No obvious elements nor blocking point found,
Some preference for 1.9K