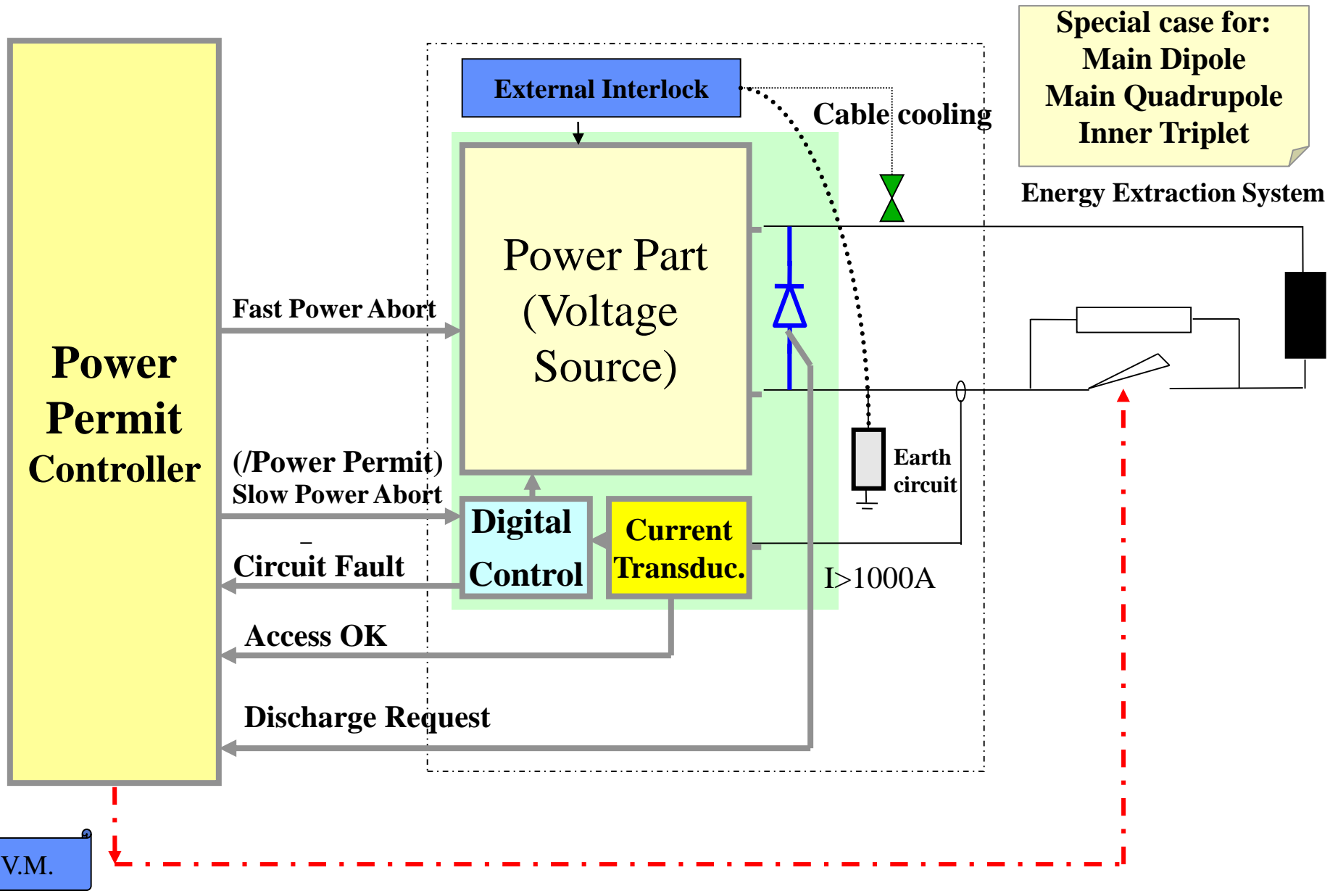


Ideas about the concept of LHC Powering Zones:

- One Power Permit Controller (PPC) is intended to monitor all circuits attached to one "Powering Zone"
- A **Powering Zone** could be :
 - ◆ one triplet cryostat
 - ◆ one matching section cryostat
 - ◆ one arc (for this particular case \Leftrightarrow 2 PPCs)etc...
- a Powering Zone \neq a Cryostat
(but not always...)

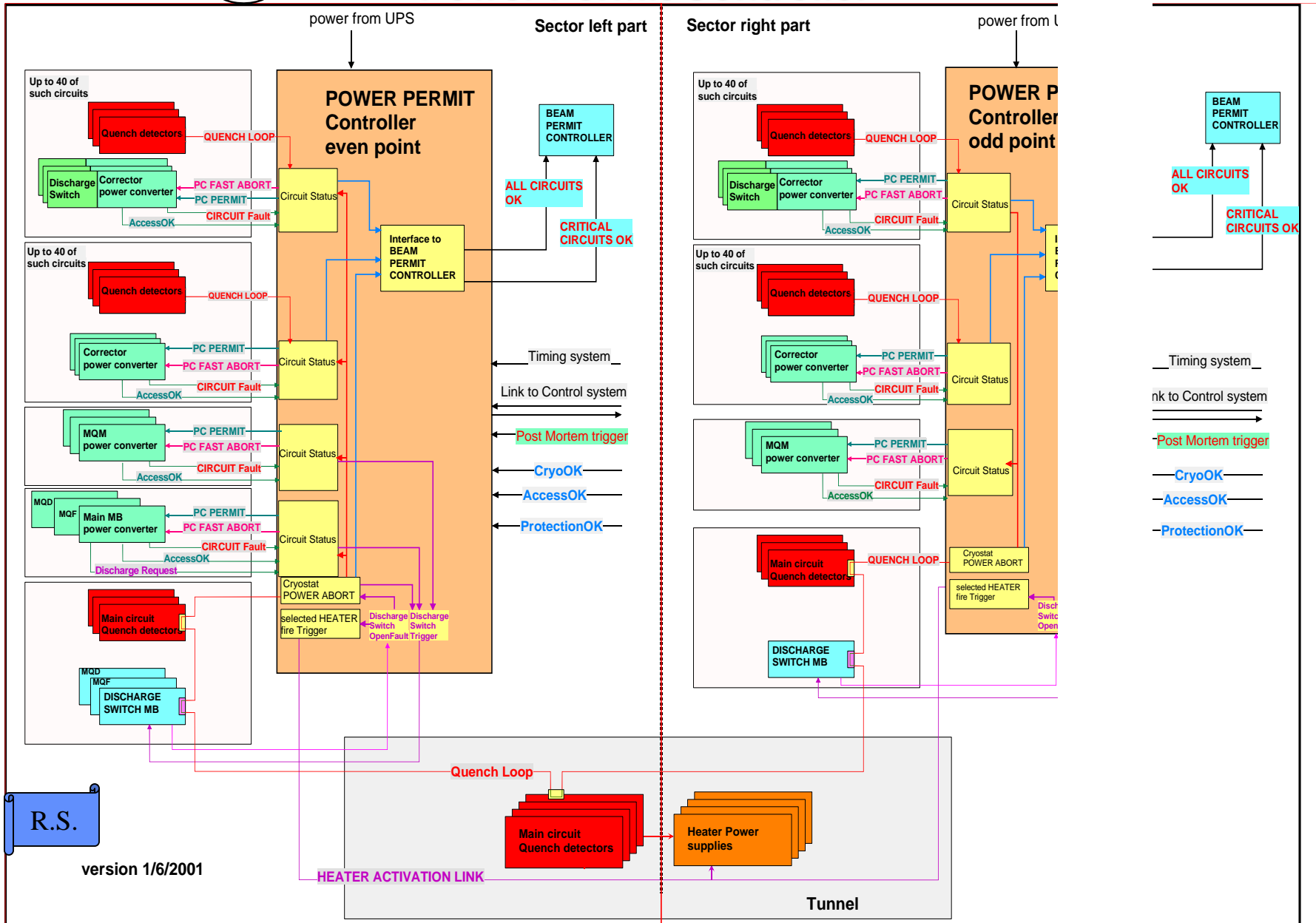
Reminder

Interface between a PPC and a Power Converter



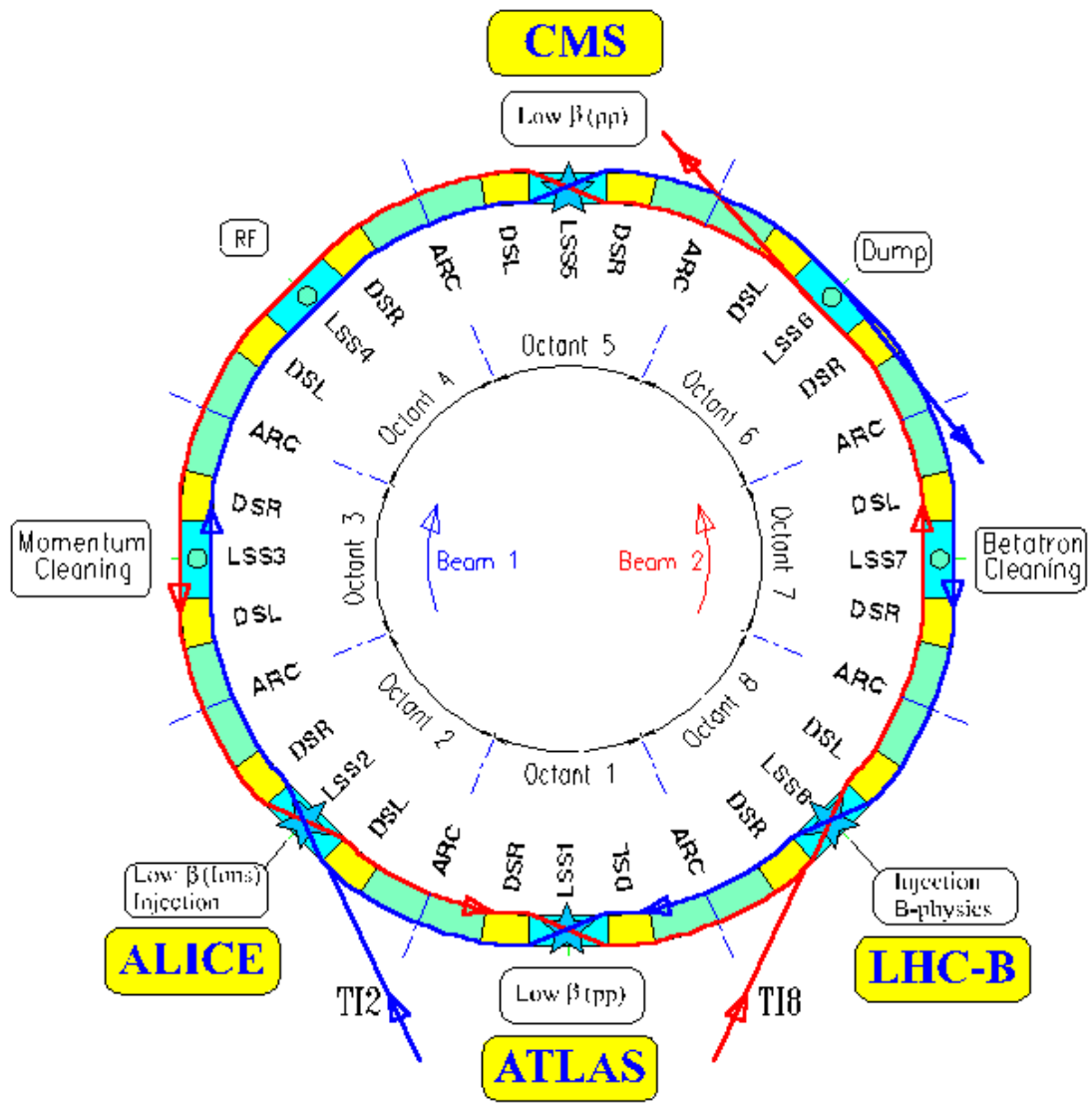
Reminder

Power Permit Controller

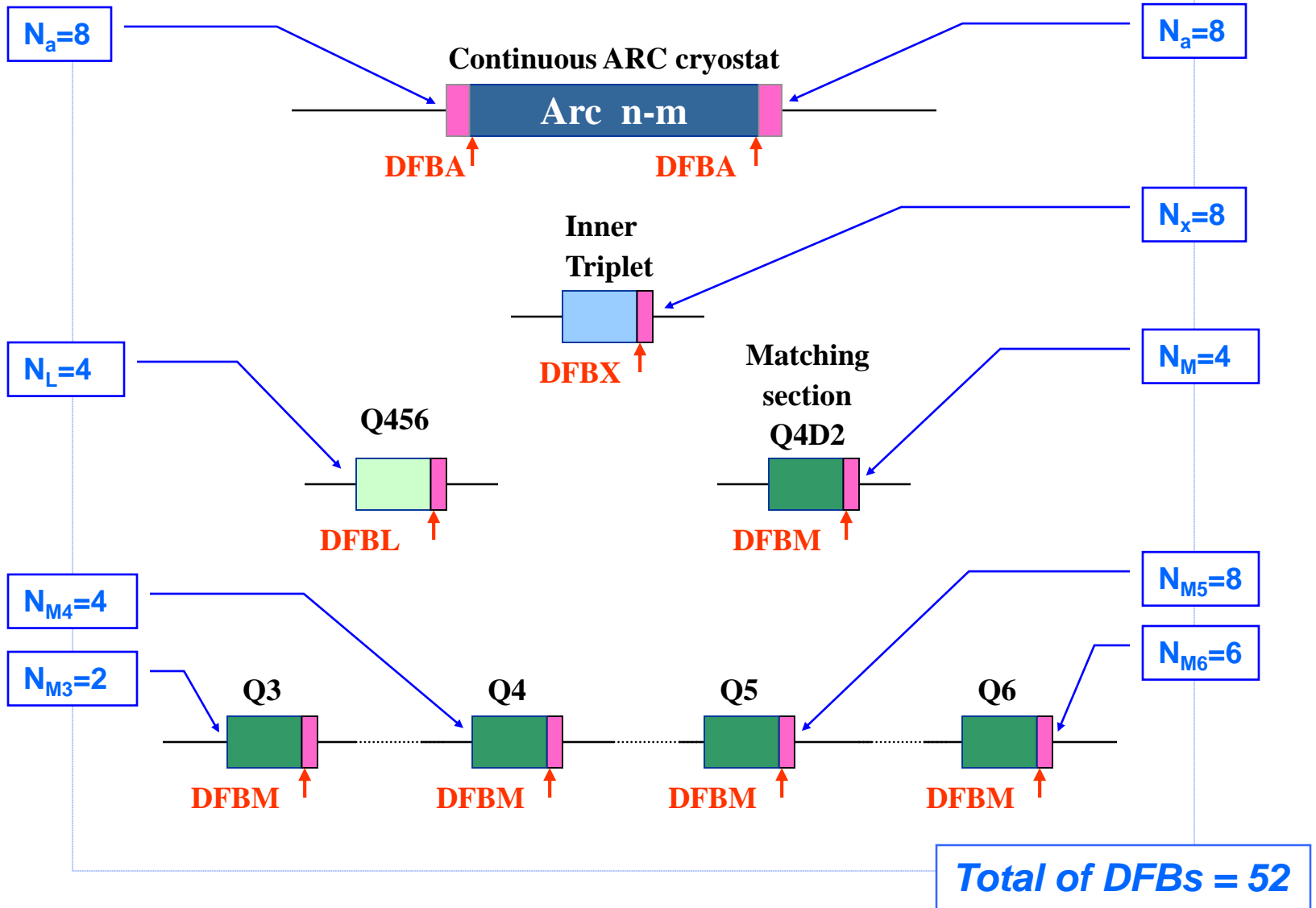


Reminder

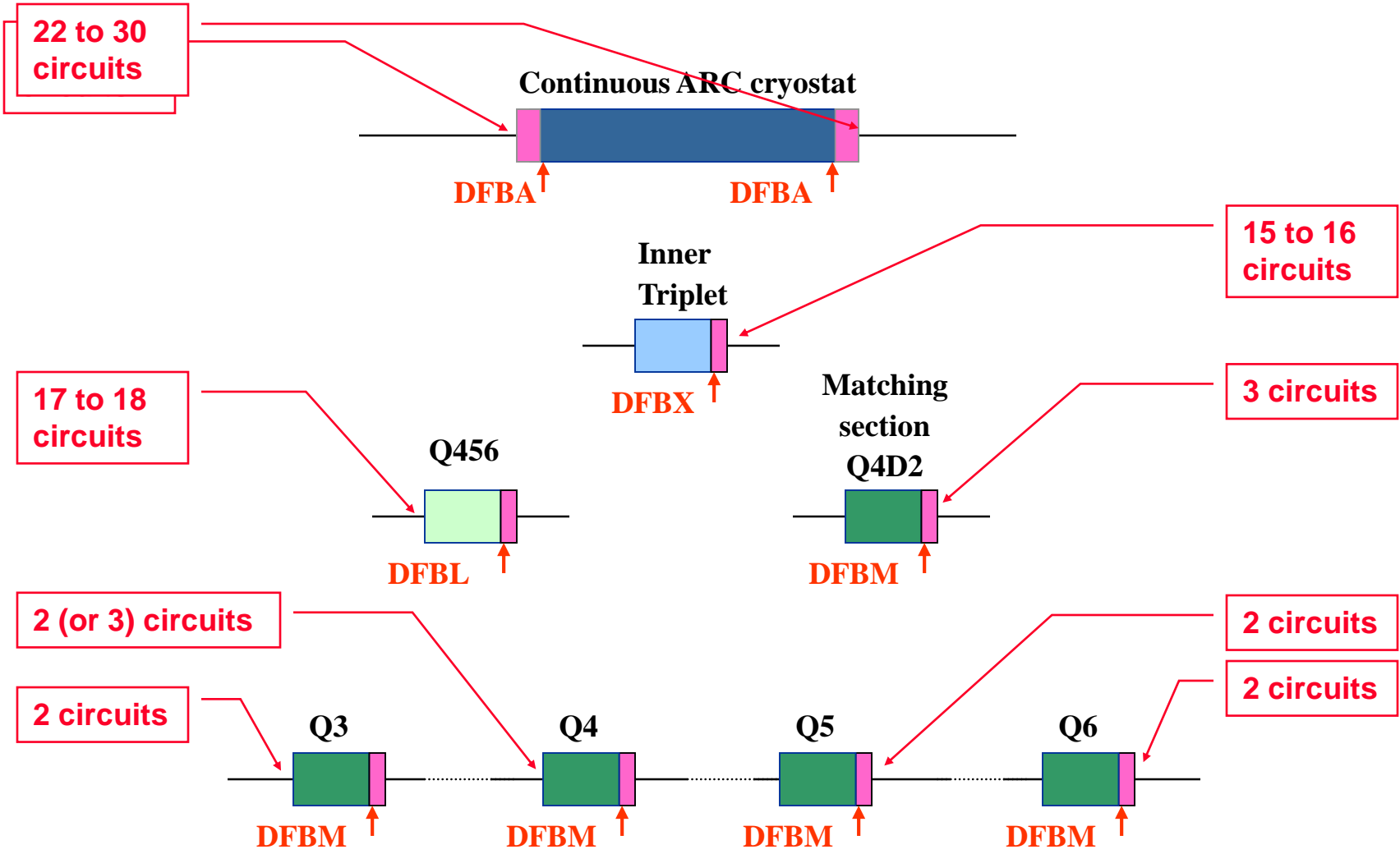
LHC Layout



Type of LHC Cryostats:



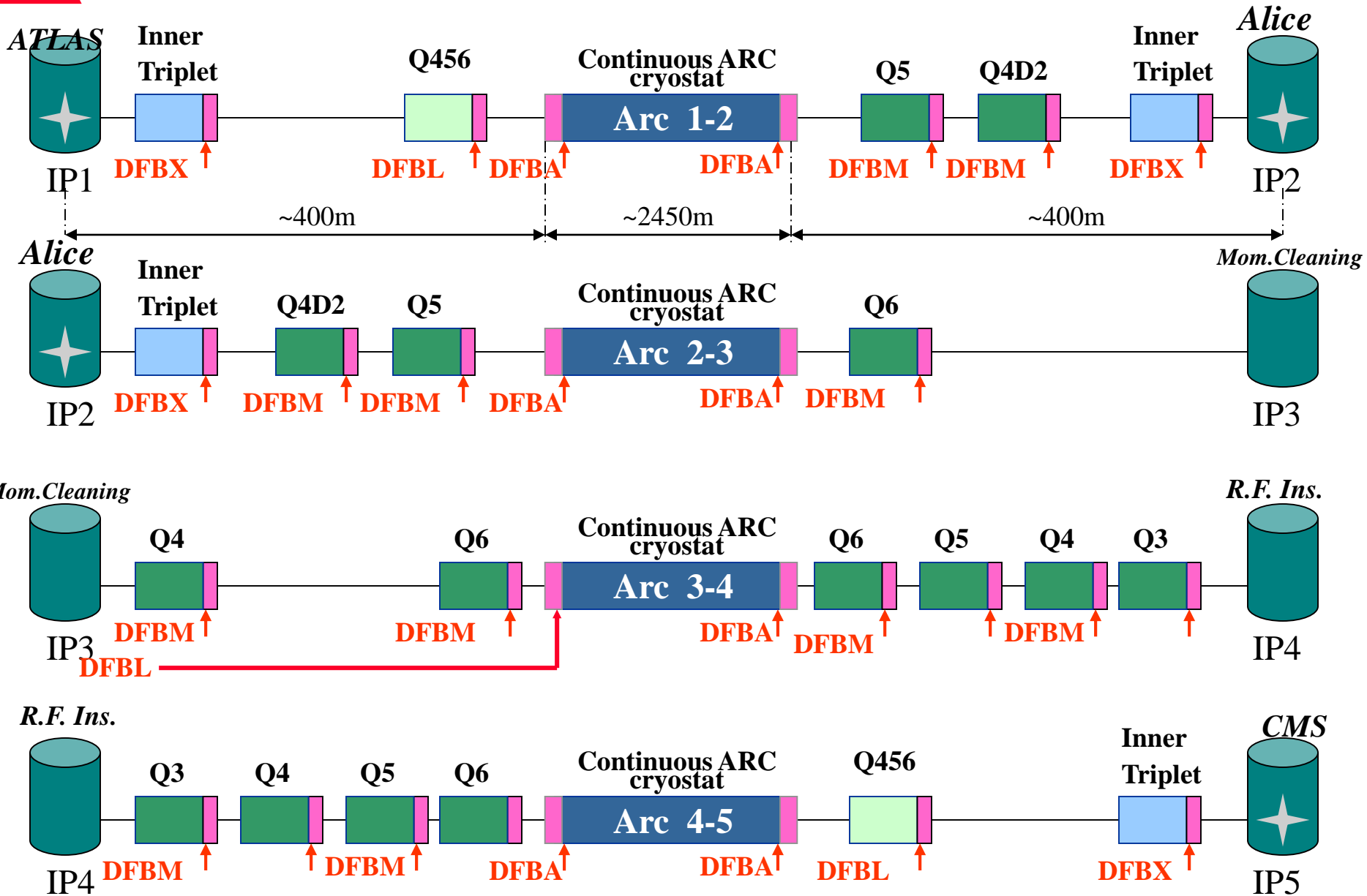
Number of circuits per DFB:



**Source: the LHC Machine Layout Data Base
"All_V6-3_Master.fp3" from Paolo Burla**

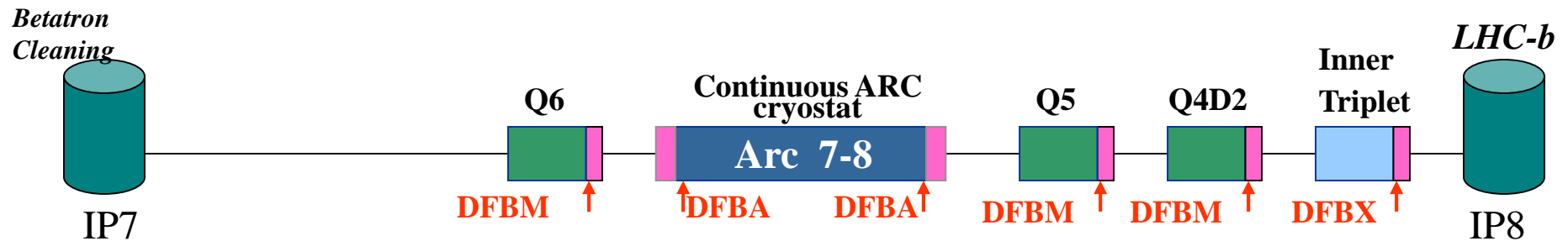
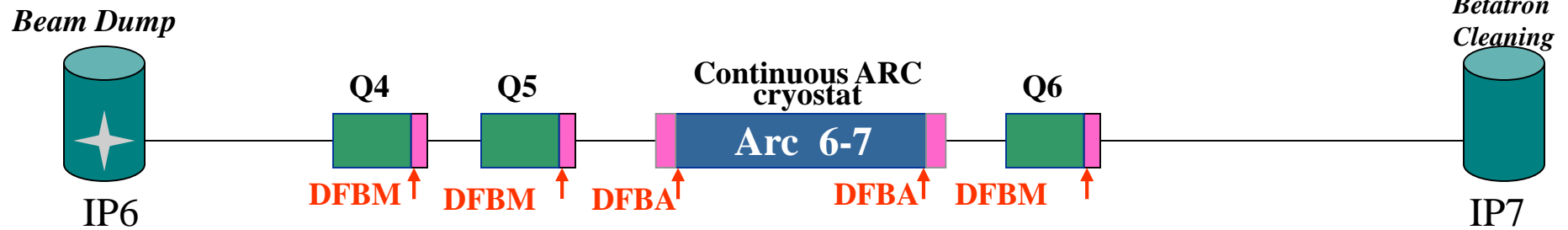
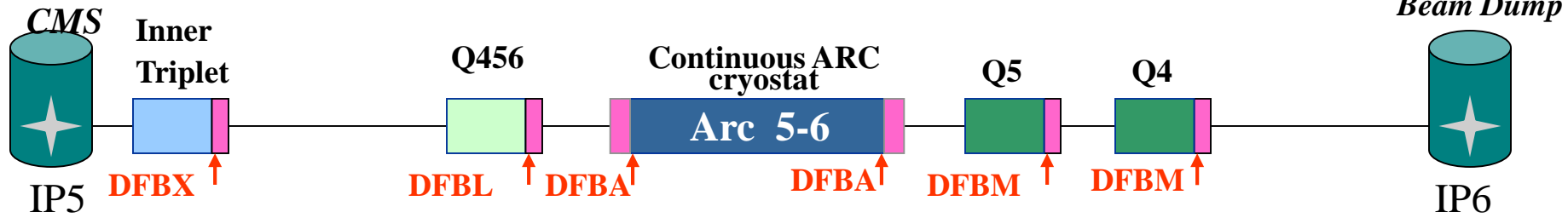
! Not a scale drawing!

The 4 first sectors:



 *Not a scale drawing!*

The 4 next sectors:

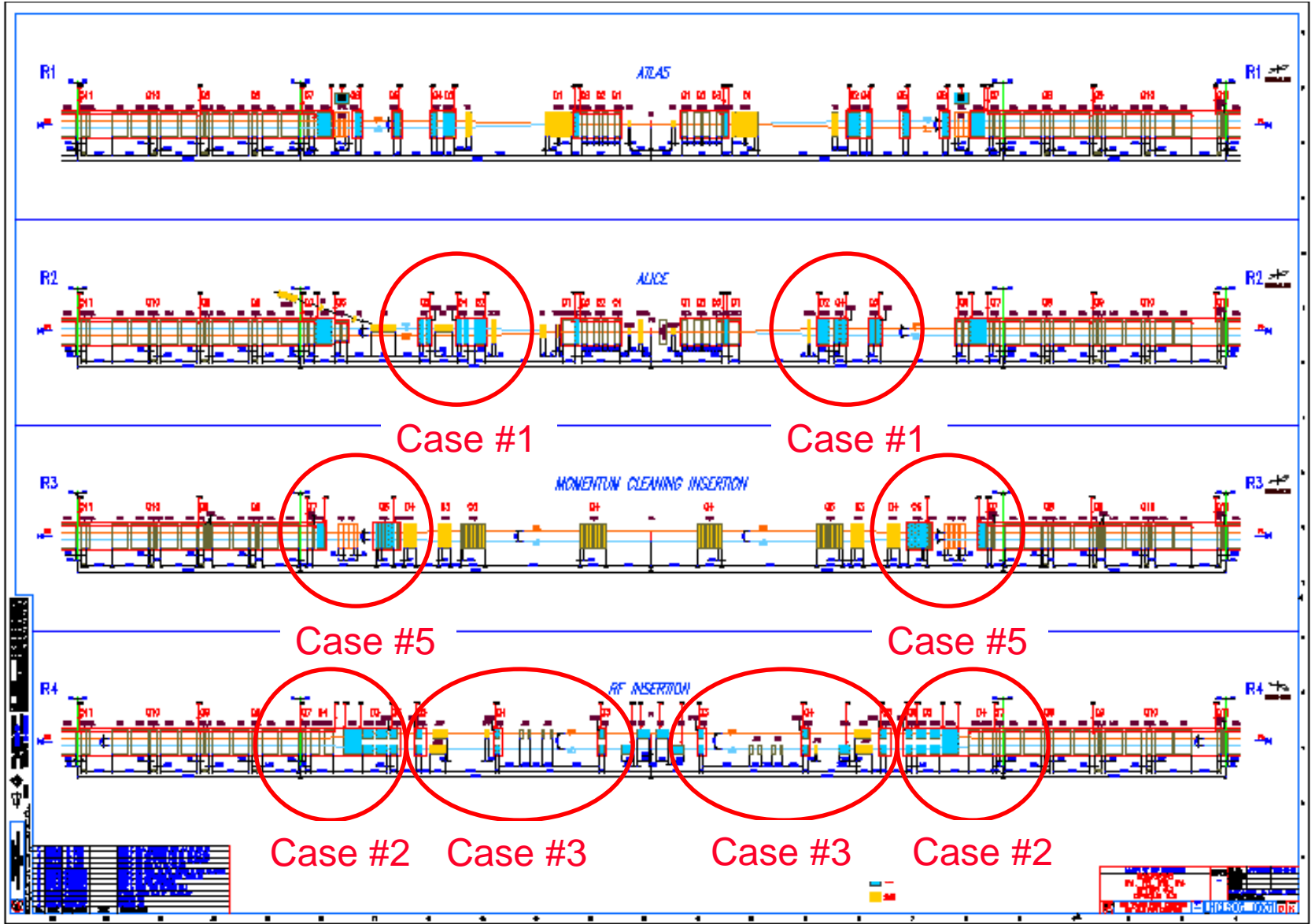


Why Powering Zone ?

- The Powering of LHC is made in sectors (*i.e.* 8 "machines")
- Independent testing of stretches of machine (*similar to String 2*)
- Quenches or faults in one Powering Zone of a machine will have no impact on other parts of the machine.
- Construction and testing of the LHC machine will take more than 2 years \Leftrightarrow *modular commissioning*

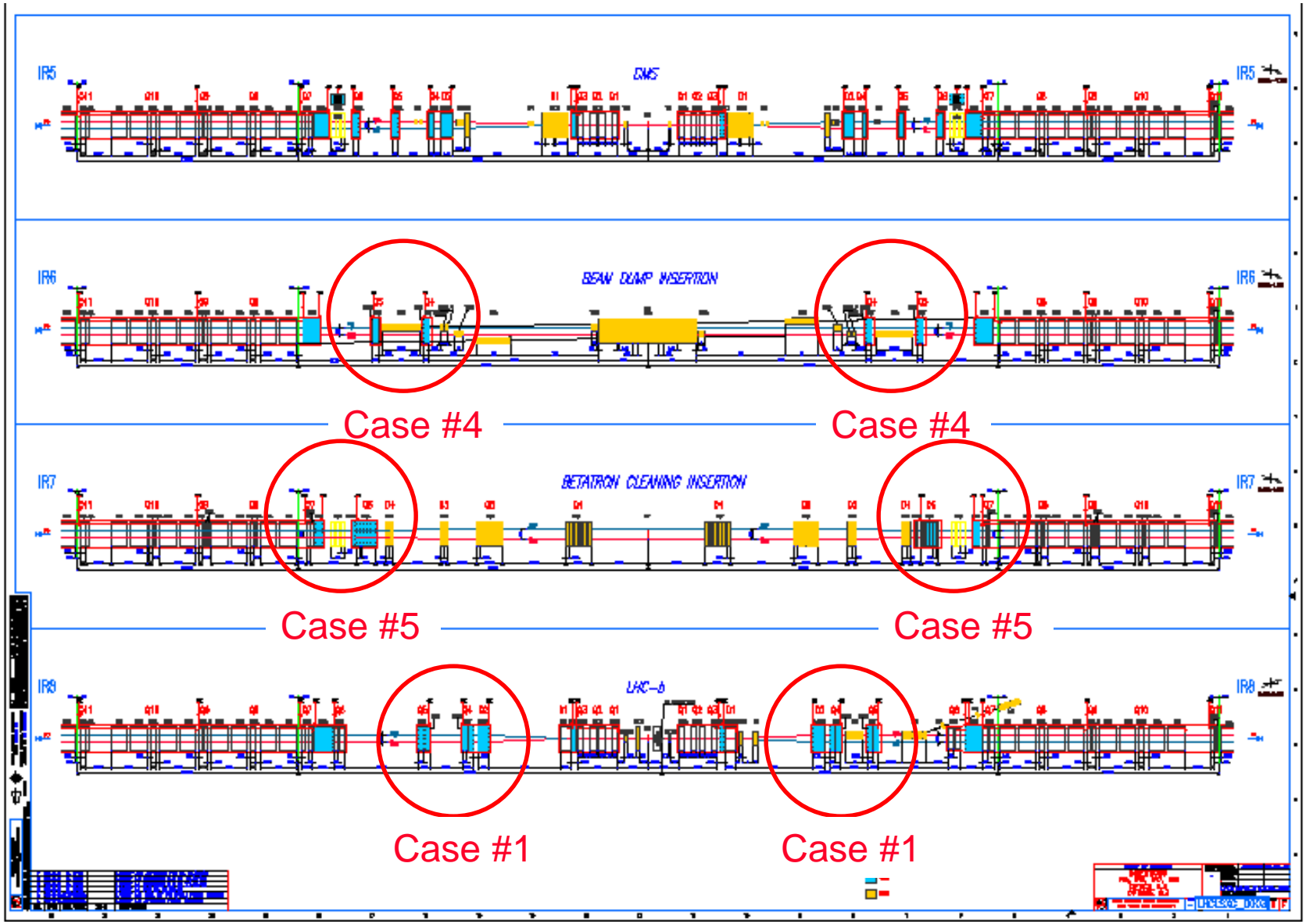
General view

The different cases identified in the 4 first sectors



General view

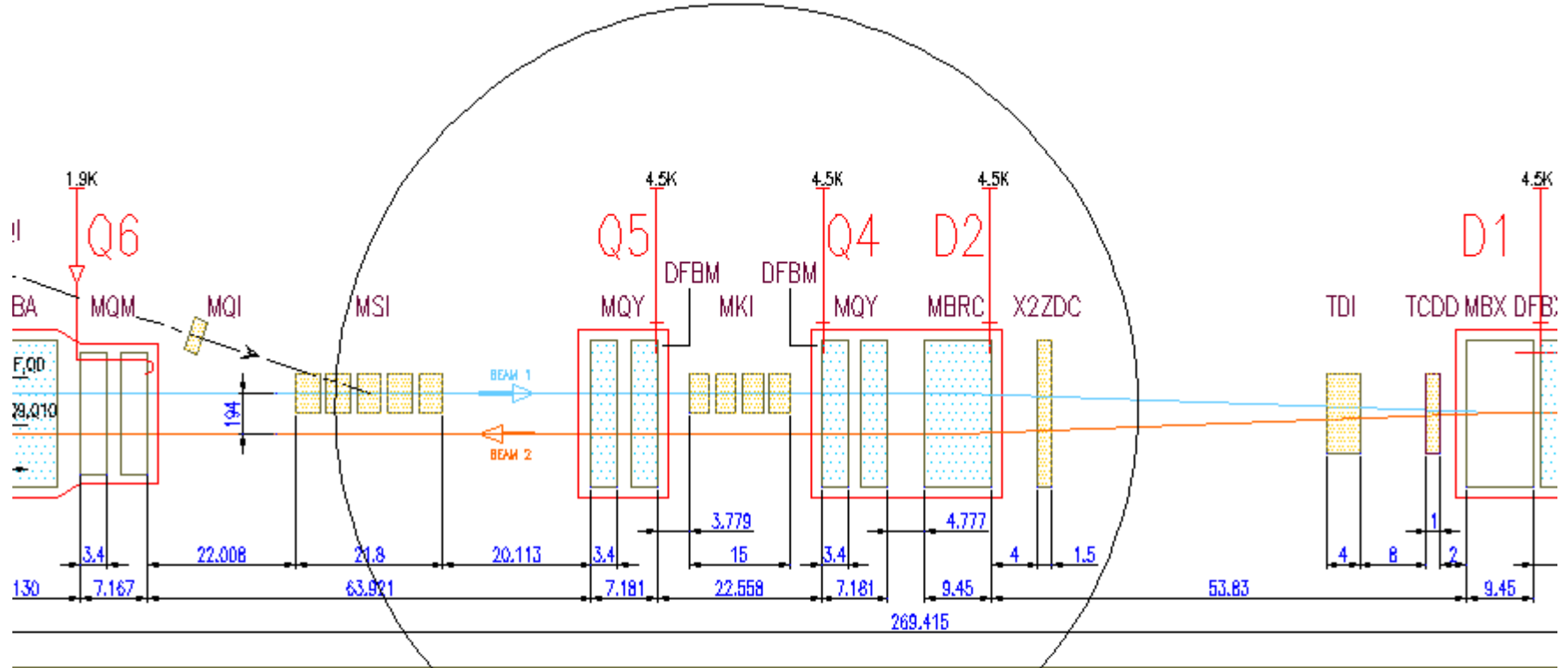
The different cases identified in the 4 last sectors



detailed view

Case #1:

Where the Cryostats for Q4D2 and Q5 are close to each other and could be merged...



← ARC 1-2

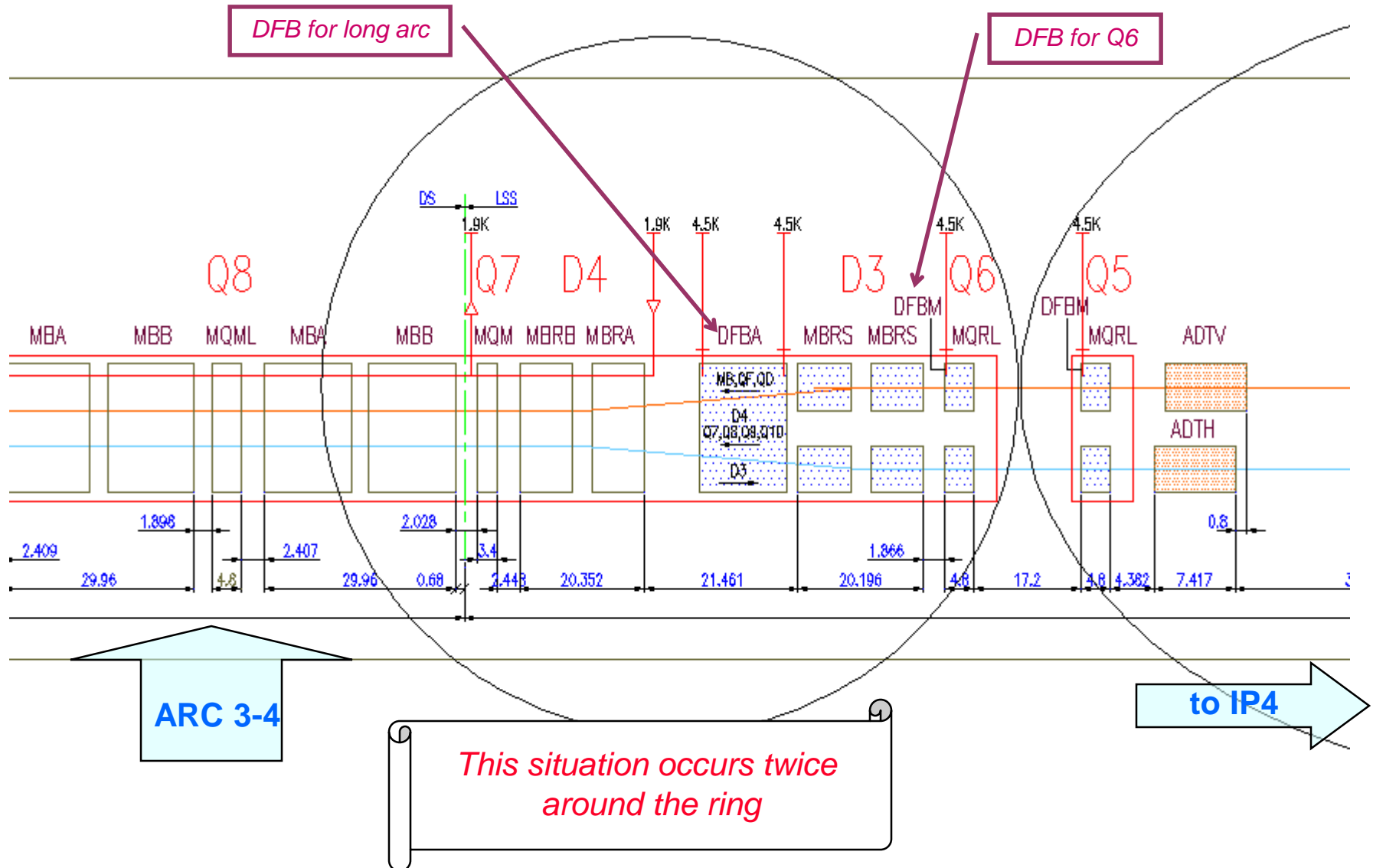
→ to IP2

This situation occurs 4 times around the ring

detailed view

Case #2:

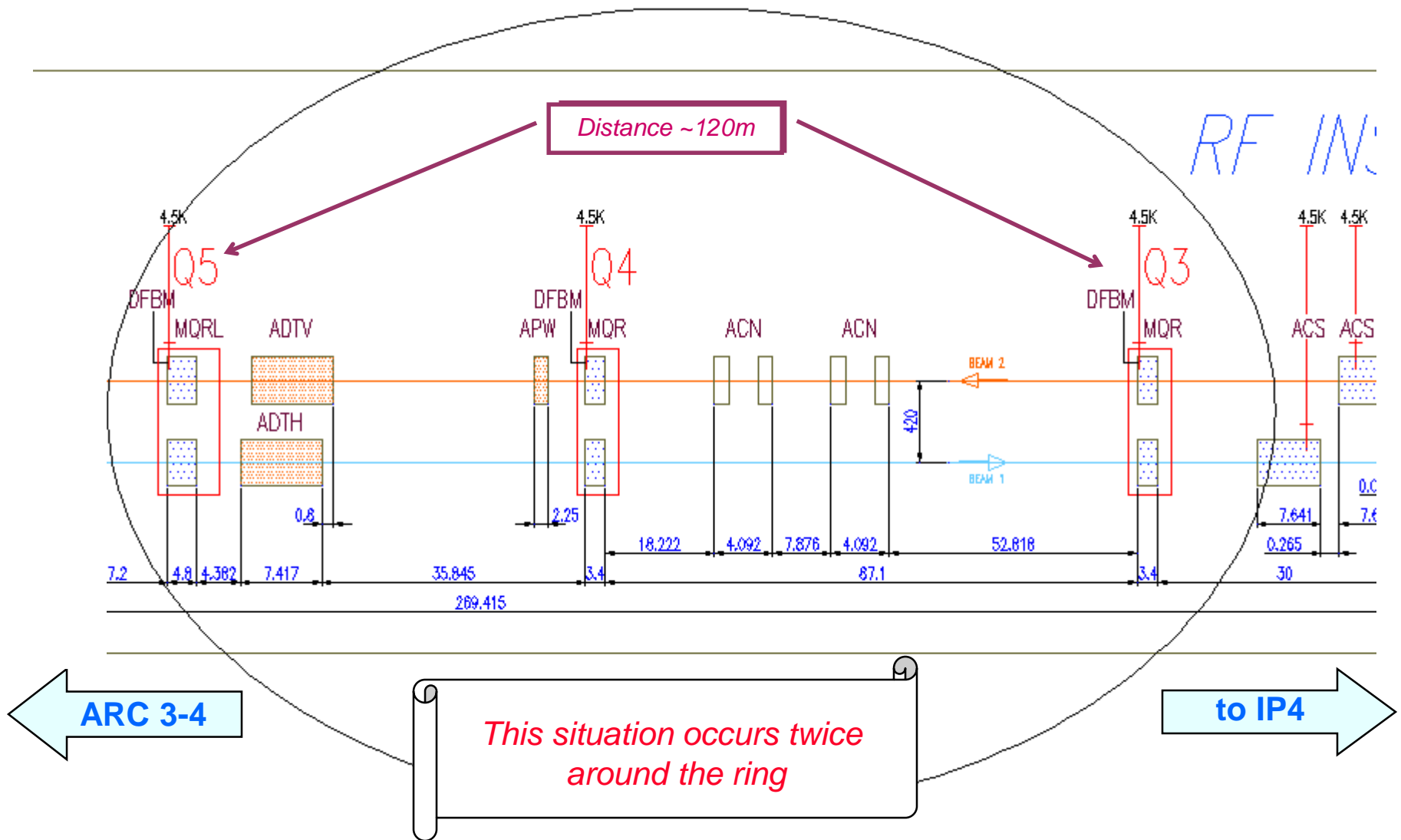
Where Q6 has its own DFB but is installed inside the long arc cryostat



detailed view

Case #3:

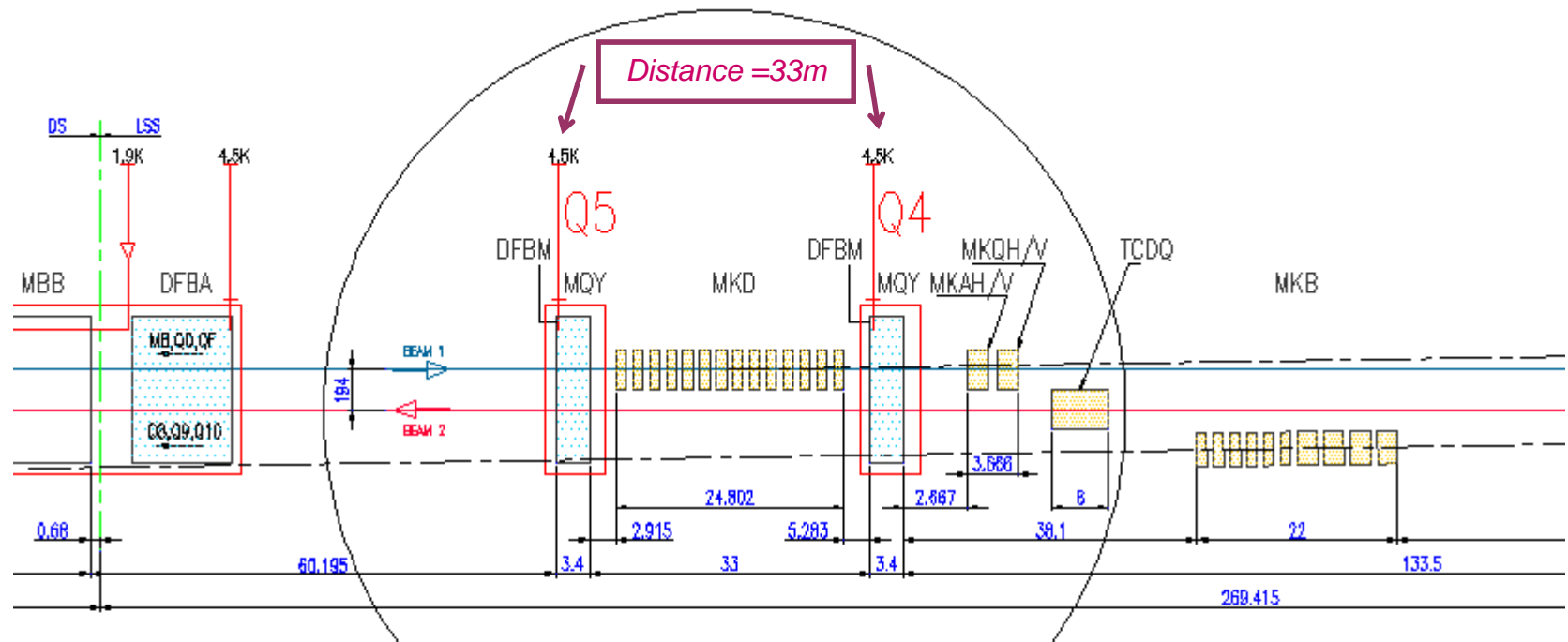
Where the Cryostats of quadrupoles Q3, Q4 and Q5 could be merged...



detailed view

Case #4:

Where the Cryostats of quadrupoles Q4 and Q5 could be also merged...



ARC 5-6

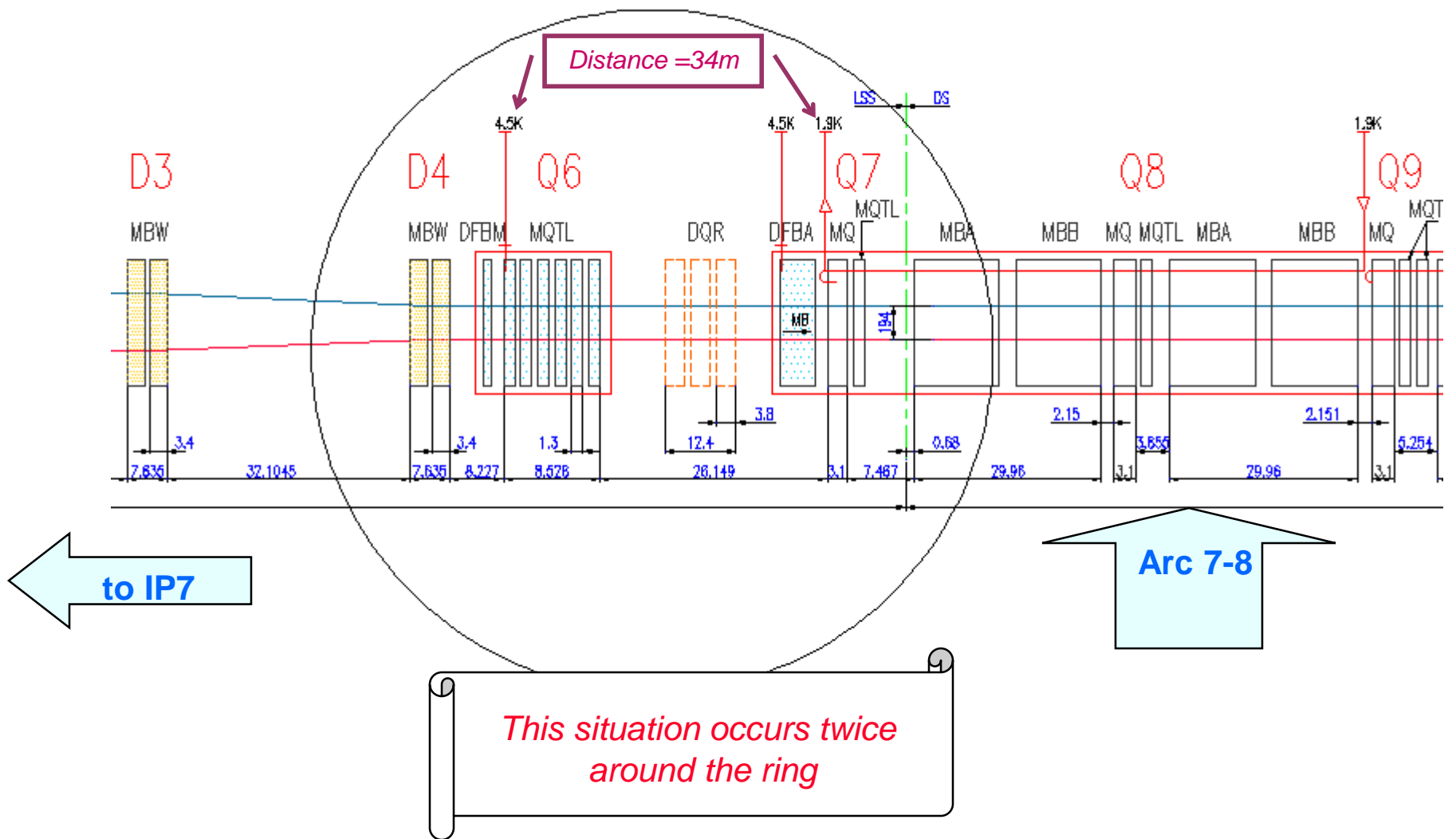
This situation occurs twice around the ring

to IP6

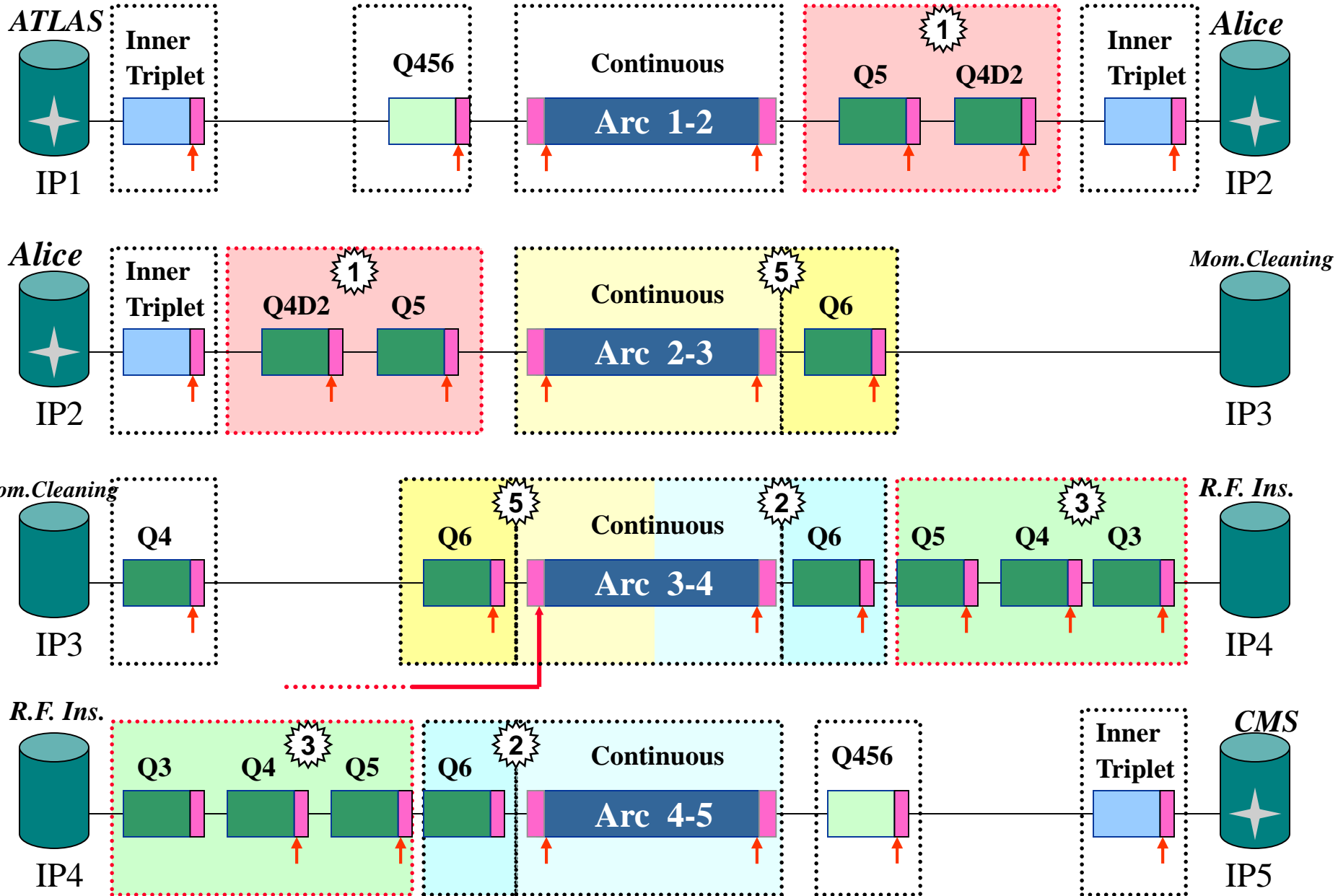
detailed view

Case #5:

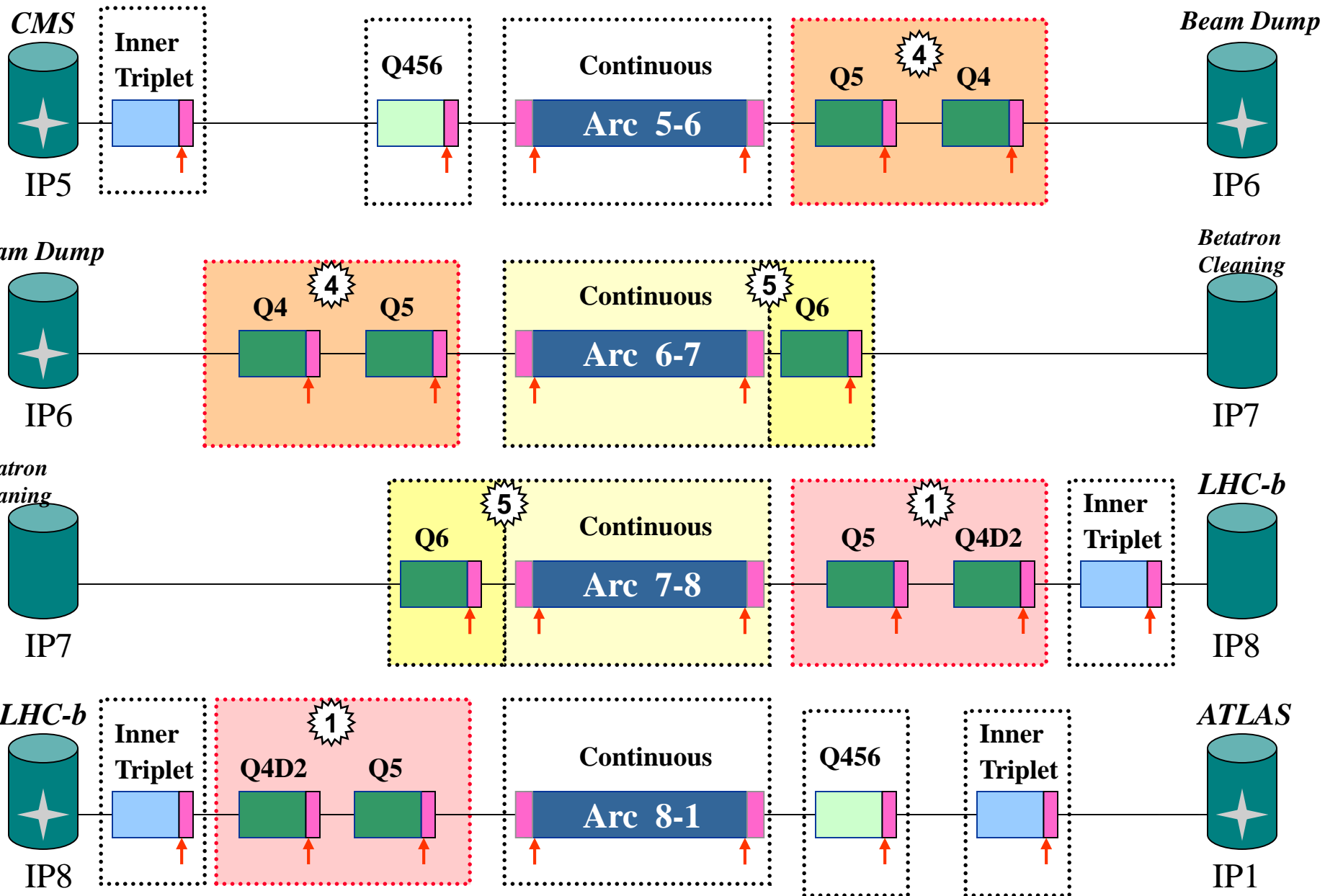
Where the Q6 cryostat is nearby of the long arc cryostat and could be included in the arc Powering Zone...



Proposal Review for Powering Zones (1/2)



Proposal Review for Powering Zones (2/2)



Conclusions about the Powering Zones:

- 1 Powering Zone \Leftrightarrow 1 Power Permit Controller
(2 for a long arc)
- Easier to control the powering:
 - ◆ one "green light" from the Cryo. system
 - ◆ one "green light" from the Quench system
 - ◆ one "green light" from the Access system
- by reducing number of Power Permit Controller
(\sim 36 P.P.C. will be used to monitor all the circuits
attached to the 44 cryostats via 52 DFBs)
 - ◆ maintainability \nearrow and cost \searrow
- Open question: what about the warm magnets?
dedicated protection?
or be included in the nearest Powering zone?