

LHC Pre-commissioning - The Sector Test: Discussion

M. Lamont, CERN, Geneva, Switzerland

1 GETTING READY FOR BEAM

- The window for tests with beam will be closed by LHCb installation due to start on 4th November 2004. It will be possible to continue system testing after the start of LHCb installation. It was pointed out that there will plenty to do elsewhere during this period.
- Is a full sector quench test foreseen? Is recovery from a simulated power cut foreseen?
- Will only pilot bunches be taken? To be decided. It might be interesting to establish magnet quench levels with beam during this time, implying the injection of higher intensity batches.

2 CRYOGENICS

- Is there any chance of design changes if problems are found at String II? Not really!

3 VACUUM

- On the subject of sectorization, the pump-down will be incremental and staged sector by sector with pump-down taking about a week via intermediate and low pressures.
- There will be a pressure test for the whole arc.
- There will be problems and repairs. Need to stage all tests and repair locally.
- Would any electron cloud diagnostics be possible? Apparently not, would need at least one third nominal intensity at least to see anything.

4 POWERING

- Measurements and commands must be synchronised.
- The powering of the IR8 if it includes the inner triplets will be challenging.
- On the subject of tracking with respect to a reference: the error between two power converters can be up to twice the specified tracking error. This has been taken into account. The reproducibility of tracking was questioned, and the possibility of feedback via the effect of energy errors on the orbit in dispersive regions discussed. HERA has feedback (or feed-forward) from reference magnets, but not the individual arcs.
- There is no dependency of tracking on the ramp rate. There is no lagging error.
- Power converters to drive the spool pieces will be available. The minimum number required has yet to be established.

- The transfer function between current and field has apparently been measured for the dipoles. The delay, to be confirmed, was quoted at around 10 ms.

5 RHIC SECTOR TEST

- The importance of testing the final configuration, viz a viz the insertion triplets was stressed.
- The orbit system was fully re-configured after the sector test, when the reliability of the integrated system was compromised. This shouldn't happen for the LHC.
- Apparently some difference between measured transfer function and that observed in machine. Difference not explained.
- Ramp problems due to cross-talk between nested power supplies in the insertions and non-tracking of power converters to the desired ramp functions. Freddy stressed the problems caused by having the design, prototype, and production process squeezed into too shorter time span.

6 EXTRACTION, TRANSFER AND INJECTION

- The possibility of a delay in the production of the LHC kickers was raised. Things should be all right but might need to foresee the use of dipoles in the event that the kickers are not ready.
- Access for TI8 will be given as part of the SPS system.