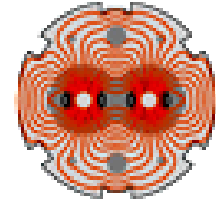


PROTECTION SYSTEM FOR LHC SUPERCONDUCTING ELEMENTS

- ◆ Magnets
- ◆ Busbars
- ◆ HTS current leads



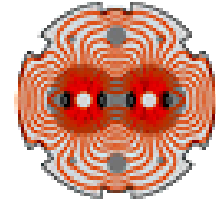
Protection Equipment with an Interface to the Machine Protection System



- ◆ **Quench Detector (various types)**
 - Detection of a resistive transition (quench) in the protected superconducting element(s) generates a QUENCH signal.
 - In any case a QUENCH signal is present, the connected power converter must stop (fast power abort).
 - Depending on the protected circuit additional measures may be necessary to be taken (e.g. activation of the energy extraction system).
 - For all magnets with active protection the detector will directly trigger the quench heater power supplies.
 - Interfaces via a hardwired link, e.g. a current loop.
- ◆ **Acquisition & Monitoring Controller**
 - Provides information required for power permit.
 - Interfaces via a fieldbus (WorldFip).



Constraints



- ◆ **Most of the quench detectors are installed in the LHC tunnel (2016 out of 3336)**
 - Equipment including the interface must be radiation tolerant.
 - Technical specification expected by end of the year.
 - Request for cables must be submitted in the near future (see next TEWG meeting).

- ◆ **Interface to MPS**
 - Technical specification as soon as possible.
 - Tests absolutely necessary (String II).
 - Radiation tests to be done within this years campaign in TCC2.
 - Thorough qualification of critical components (e.g. relays) to be launched soon.

- ◆ **Responsibilities to be defined**