Powering Tests and Safety
Summary and Conclusions

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Underground access during powering tests

- With the start of cool-down HWC takes the responsibility of the Sector. Sector in Restricted mode.
- Rules and procedures for Access during powering are in place or being finalized (assuming that all modifications are in place: ventilation doors reinforcement, etc):
  - Access and Powering Conditions for the Superconducting circuits in the LHC (EDMS 1001985)
  - Access restrictions in LHC and SPS During LHC Powering Phase 2 (EDMS 1010617)
  - *Transition from Powering phase 1 to Powering Phase 2 and vice versa (EDMS1012328)* ➔ Ideally minimized but likely to occur during Week-ends, in particular at the beginning.
  - Important to read them and understand them: signature of an ADI IS NOT a stamp on the safety of the intervention
- Rules and procedures are designed to be simple but for that some flexibility might be lost

Electrical Safety

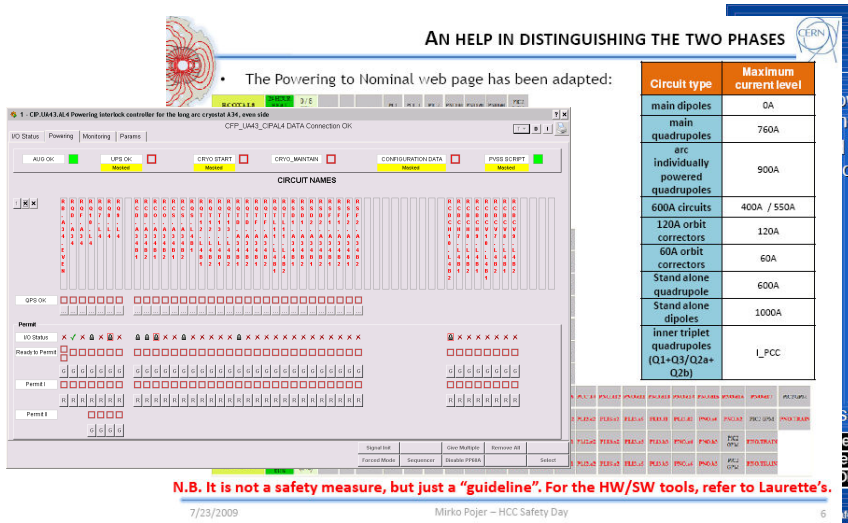
- Interventions on electrical circuits (e.g. ELQA/IFS interventions) ➔ actor to take care of requiring electrical safety conditions (e.g. Quench heaters discharged, etc.)
- Clear list of elements and their location to be put in safe conditions to be made available (e.g. QH racks, etc.)
- Electrical Safety subsector ➔ key definition for Electrical Safety need to have drawings or better displays indicating the location and access/powering status ➔ ongoing
- Electrical awareness web course is needed for getting access rights ➔ attend it
- Yellow paper is your “access key” for safe electrical intervention

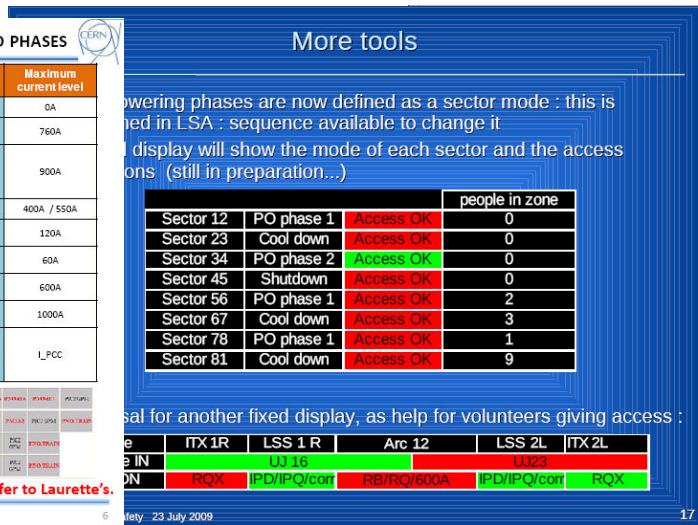
Cryogenic safety

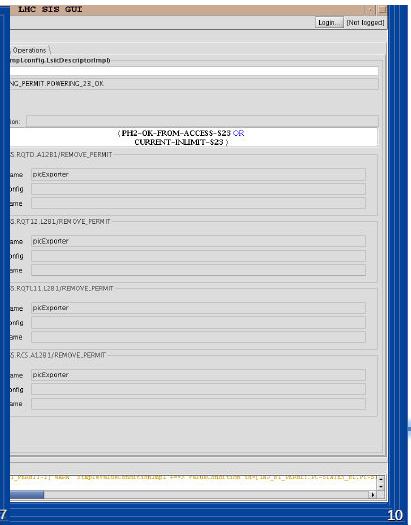
- Additional risks identified (partly as result of increased number of relief valves) but not only:
  - He release independently of powering (He-Jam and Multi He-Jams) in Phase 1
  - Massive He release during Phase 2 powering
- Bio-cell course will become obligatory for obtaining access rights
- Warm does no mean no risk (➔ Cryo Consignation)
- Cryo permit is your “access key” for cryo-safety
- Main issues:
  - Installation of springs, mechanical protections and deflectors before they are actually needed ➔ difficult for deflectors
  - Definition of compensatory measures and procedures to allow ELQA at cold and work around DFBAs (e.g. Cable re-connections) if needed.
    - Need to define rules for ELQA
    - Need this before we start with Sector 12
    - Deflector installation be prioritized according to needs
    - Access conditions to be made public (EDMS, LMC)

Tools

- Access will not be prevented but test will be stopped in case of incompatibility access conditions/test conditions ➔ Rely on the person giving access for unwanted stops of the tests
- Logic of the SW tools should be kept simple ➔ interventions on FGC should be notified and agreed
- Current measure not latched
- SW interlock is meant to assist the operators/EiC only







Some remarks

- Reliability of the access systems will be vital
- Discipline during access is needed
  - ➔ Check you access path (in doubt check with the Point Owner)
  - ➔ impact of forced door is large (you will pay for that!!!)

- Understanding of the rules and overview of the powering is needed at all times
- Attention when only part of the machine will be powered
- Discipline and advance preparation and announcement of interventions is needed
- Prioritization of the modifications related to new safety requirements adapted to schedule ➔ ongoing. Important to maintain coherence

Remarks

- Safety of people has always the highest priority
- All work, tests, interventions must be planned, prepared, authorized and the agreed procedures respected

There a several colleagues prepared to help for any kind of questions

- Ghislain Roy and his team
- John Robert Etheridge, Emmanuel Paulat, Michel Arnaud
- Safety commission (B.Delille and colleagues)

- and for the coordination the Hardware Commissioning Team (point owners) and the Shutdown Coordination Team

Many thanks to all the speakers

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