Summary Session – Electrical circuit related Protection

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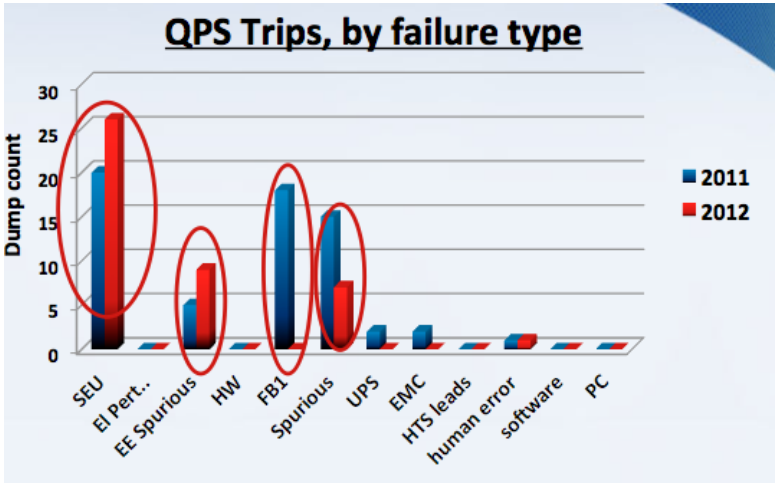
Powering Issues

- Up to 50% of premature beam dumps from LHC magnet powering system(s)
  - Few but big systems
  - Merits continuous attention for reliability + potential of increased availability



- Revisit dependability studies including interfaces in light of experience + criticality (diverse redundancy)
- Powering tests to be organized and followed continuously (CSCM, EOY, TS,…)!
  - Potential problem: Very efficient test execution tools but analysis not up to same speed?

Changes in QPS

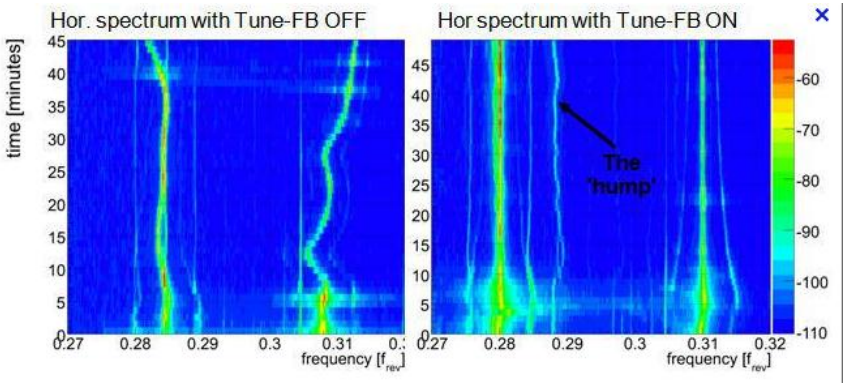
- Huge amount of extensions/changes foreseen in little time
  - (Big) improvement in availability expected after LS1
  - Threshold revision for 600A circuits and HTS leads
- Major upgrades can only be smoothly implemented during long shutdowns ?!
  - Some incidents due to known issues not put into machine due to resource constraints…
- Still (too) big dependency on human interaction/procedures
  - -> Tools, tools, tools,….?! Yes, but see previous….
  - Need to sit to define and prioritize

Changes in Powering Interlocks

- Studies of converter regulation vs FMCM must be given priority during LS1 (14 avoidable dumps in 2012!)
  - Limit of relaxing thresholds is reached (6.5TeV!)
- In general redundant protection assured, few incidents (MSS, triplets, SW interlocks,…) to be followed
- Disseminate information to allow consistent masking of interlocks throughout systems
  - Mechanisms to automatically unmask with beam (a la SBF)
- ALARMS definitions to be reviewed (need help/driving from OP!)
- Access vs Powering Interlocks -> Will be more restricting for re-commissioning campaign ?!

Electrical distribution – How to ensure dependable and redundant powering of systems

- Complete UPS replacement to restore true redundancy and increase availability
  - Will we finally find the hump?! (switching frequency 8kHz – > 4 and 7 kHz



- Organize full-scale tests for redundant powering (> preparation with equipment teams, EN + CO)
- Quality of network will not (much) improve, need to continue identifying and improving weak elements (FMCM vs PC,…)