

Tests performed on RB.A12

- Why ?
- What was done ?
- Results

Many thanks to Nuria, Sandrine, Rudiger and Bernhard + OP team and logbooks

Tests performed on RB.A12

➤ Why ?

Quench heaters firing after faults on RB circuits were noticed and analysed [40 cases from 2008-2010]

N Catalan / S Lenaour (Will be presented at MP3 tomorrow)

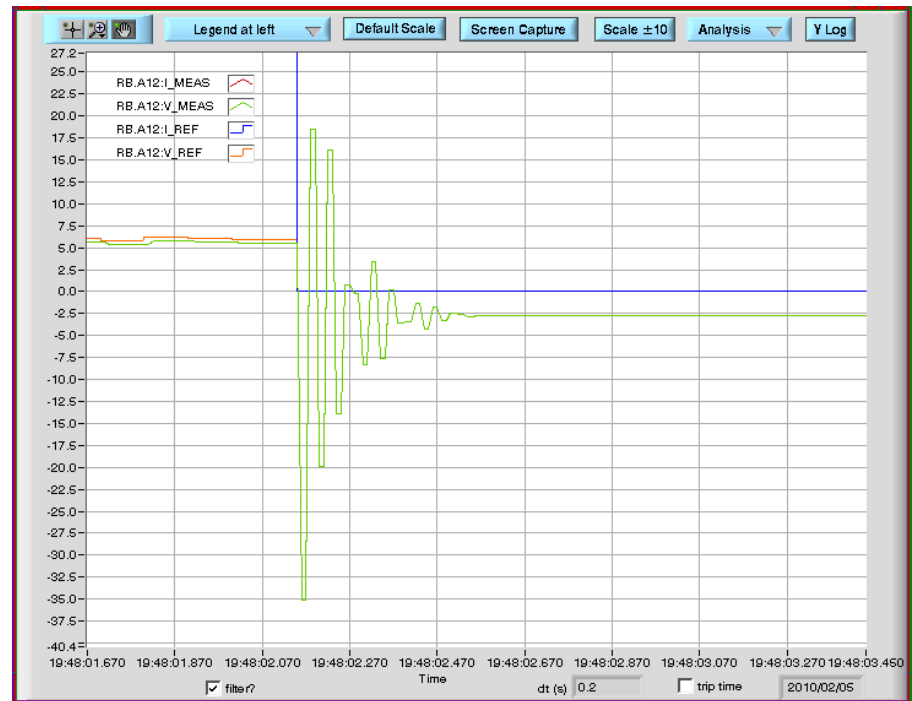
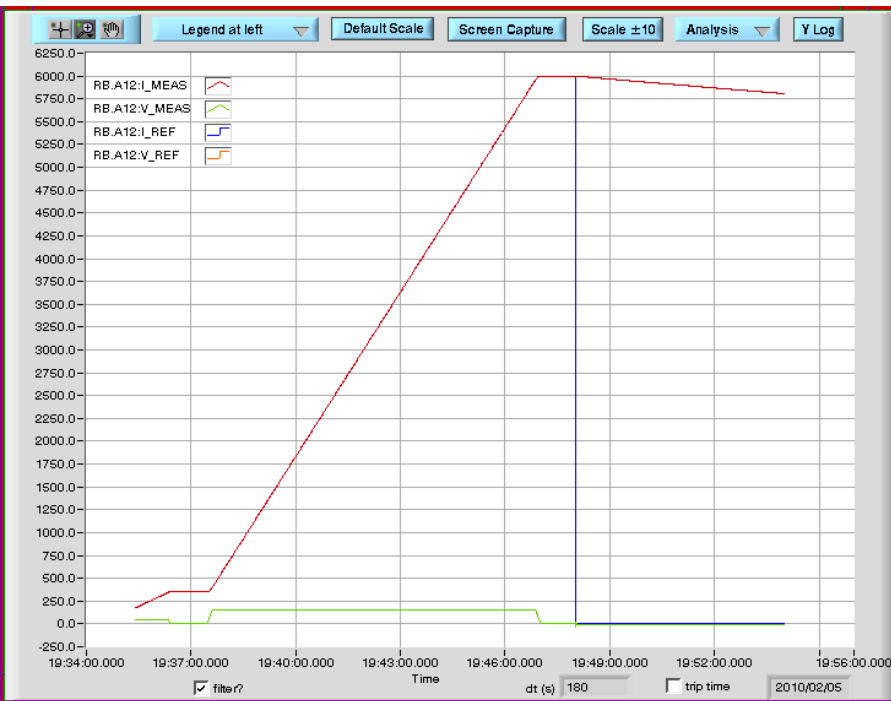
3 cases :

- ❖ Simultaneous FPA and PC fault
- ❖ FPA required by QPS
- ❖ PC fault followed by FPA

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Simultaneous FPA and PC fault

- PIC global protection mechanism, trip of other circuits during the ramp-up or ramp-down
- EE opens few milliseconds after the converter stops.
- Immediate amplification of the converter ringing in all sensitive magnets



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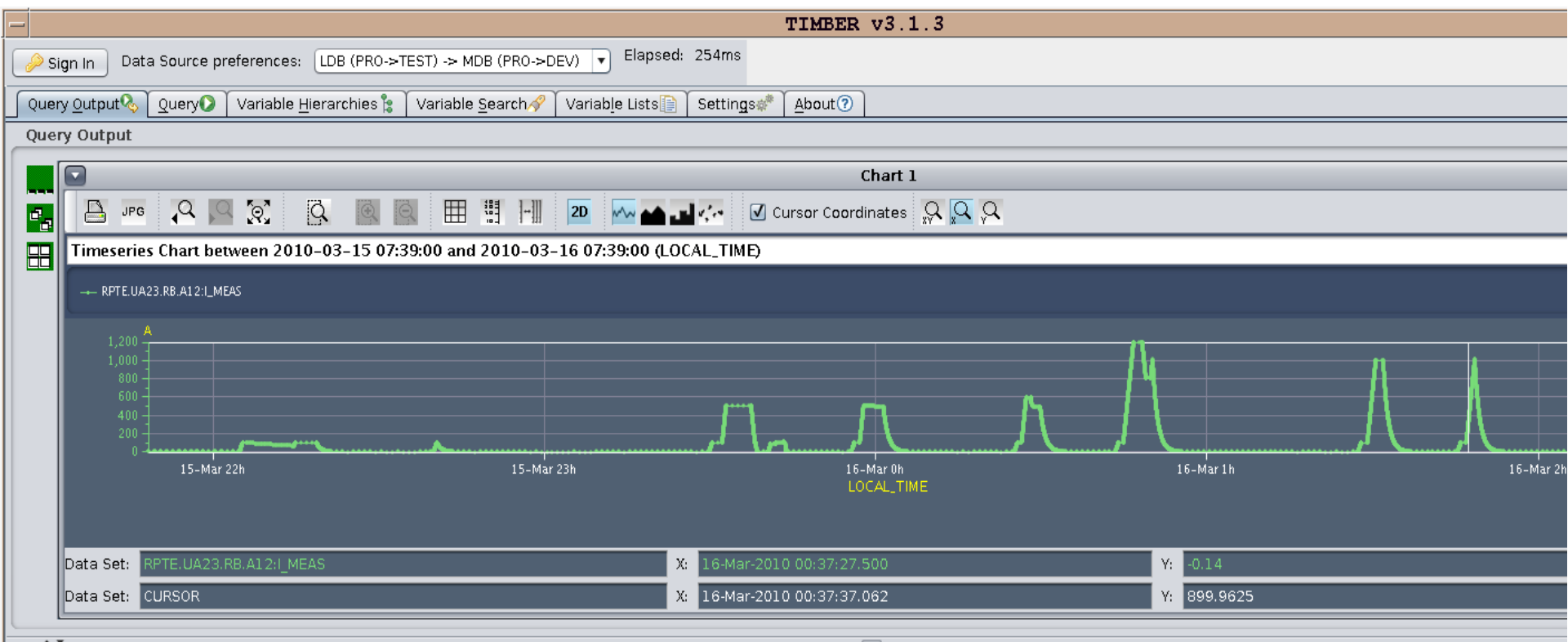
Simultaneous FPA and PC fault

- Proposal :
 - Delay the PC off by PIC by 20 ms
NB: This is affecting all 13 kA circuits : Type A circuits (RB, RQD, RQF, triplet)
 - Global bus bar detector for sector 12 threshold increased (functionality taken over by nQPS BS system) [From 1V to a few V]
- PIC tests performed yesterday to check the 20 ms delay (OK) without current
- Tests performed with current (1/2):
 - RB: ramp to 500A, slow abort during constant current (produces a controlled ramp down) - nothing trips
 - Ramping up and provoking a fault around 500 A: no trip.
Then switch opening around 400 A : no trip
 - Ramping down (-10 A/s), and provoking a fault around 500 A: no trip.
Then switch opening around 400 A : no trip
 - Ramping up and FPA from PIC around 1 kA: heaters fired in two magnets, A20L2 and B17L2

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Simultaneous FPA and PC fault

- Tests performed with current (2/2)
 - Ramping up and PC fault generated around 1 kA, after few hundred ms, the switch opened and no heater was fired.
No global busbar postmortem that would point at an HTS trigger, and splice-monitoring shows all nQPS BB signals well behaved.



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Remarks

- A11L2 : Threshold increased to 260 mV ; no trip anymore
- Thresholds of other magnets seem too low ; to be increased
- Data to be analysed in detail ; delay of PC off by PIC not completely efficient

PS: Trip of RB in 23 to be analysed (Active filter activated) PO