

Radiation test - PSI

| Date | Equipment Owner | Test group | DUT |
|-----------------|------------------------|-------------------|-------------------------|
| May 20th | EN/STI | EN/STI | OSL, TLD |
| | BE/BI | BE/BI | Detector |
| June 1st | TE/EPC | EN/STI | Mosfet |
| | | | Voltage regulators |
| | | | Voltage reference |
| July | TE/EPC | EN/STI- TE/EPC | PWM |
| | EN/STI | EN/STI | Profibus module |
| August | TE/EPC | TE/EPC | FGC critical components |

- BE/BI: Request to test components for the BPM equipment. Date?
- TE/EPC: Date for August?

Radiation test CEA – 1 MeV facility

- ❖ Request of beam time in September for calibration purpose (RADMONs)
- ❖ No confirmation yet
- ❖ No further requests from other groups

Radiation test - CNRAD

- ❖ BPM components
 - ❖ LED warning system
 - ❖ QPS
 - ❖ Ethernet Switches
 - ❖ Cryo power supply
-
- ❖ TE/EPC components – later on
 - ❖ New RadMON – not sure yet

RADMON- Operation

- ❖ Deployment of the new software
- ❖ New TIMBER configuration
- ❖ Unexpected rate of reset → Debug on-going

RADMON V6 - Hardware

- ❖ Prototype tested at PSI
 - ❖ NanoFip
 - ❖ Maxim ADC
 - ❖ New components (current sources, regulators)
- ❖ Weak points
 - ❖ Temperature sensor
 - ❖ Analog switches

RADMON V6 - Sensors

❖ HEH fluence

- ❖ Cypress – 90 nm, 8 Mbit
- ❖ 4 chips on board (16 Mbit $\sigma=1.5e-13$ @230MeV \rightarrow 1 count \rightarrow $2e5$ p/cm²)

❖ TID (Si)

- ❖ Tyndall radfet 100nm
- ❖ TRAD radfet 1600 nm
- ❖ Sensor response curve under investigation

❖ 1 MeV equivalent neutron fluence

- ❖ BPW diode
- ❖ LBDS diode

RADMON V6 – Next steps

❖ HEH fluence

- ❖ Test Memory 16 Mbit

❖ TID (Si)

- ❖ Comprehensive analysis in Co60 source
- ❖ Validation on LHC field

❖ 1 MeV equivalent neutron fluence

- ❖ Test at CEA for BPW and

❖ Prototype

- ❖ Test at H4IRRAD and/or CNRAD



Back-up

Radiation test- PSI

| Date | Equipment Owner | Test group | DUT |
|-----------------------|------------------------|-------------------|--------------------------|
| 1 February | EN/STI | EN/STI | PXI power supply |
| 18-19 February | EN/STI | EN/STI | Voltage regulator |
| | | | Cypress |
| | | | Toshiba |
| | | | Diff Amp |
| | TE/EPC | TE/EPC | AC/DC |
| 17-18 March | BI | BI | BPM electronics |
| 24-25 March | EN/STI | EN/STI | Analog switches |
| | | | current regulator |
| | | | RadFet |
| 21-22 April | TE/EPC | EN/STI | Mosfet-1 |
| | EN/STI | EN/STI | RadMon prototype |
| | BI | BI | Beam Loss Monitor |

SEU events in LHC

| Date | Title | LHC point | Area | Type | SEU? | Beam Dump | Equipment |
|------------|---|-----------|------|----------|------|-----------|-----------|
| 04/05/2012 | Cryogenic compressor stop in P8 | Point 8 | US85 | soft SEE | TBC | FALSE | CRYO |
| 03/05/2012 | RF trip module M2B2, L8B2 | Point4 | UA47 | soft SEE | TBC | TRUE | RF |
| 19/04/2012 | QPS Wfip lost | Point 5 | DS | soft SEE | YES | FALSE | QPS |
| 16/04/2012 | Power converter- FGC | Point 7 | ARCs | soft SEE | TBC | TRUE | EPC |
| 13/04/2012 | Power Converter Fault | Point 1 | RR17 | hard SEE | YES | TRUE | EPC |
| 10/04/2012 | QPS-Protection 600 A | Point 5 | UJ56 | soft SEE | TBC | TRUE | QPS |
| 09/04/2012 | Power Converter Fault | Point 1 | UJ16 | hard SEE | YES | TRUE | EPC |
| 04/04/2012 | Trip of QPS 4R8 - loss of cryo maintain | Point 8 | LSS | - | TBC | TRUE | QPS |

SEU events in LHC

- ❖ QPS: 3 events (ISO150 not counted)
 - ❖ 1 Dump (Confirmed)
- ❖ PC: 3 events with dump
 - ❖ 3 Dumps (2 Confirmed)
- ❖ Cryo: 1 event
 - ❖ No Dump

SEU events in LHC

- ❖ QPS events in xls file
 - ❖ G:\Projects\R2E\QPS
 - ❖ Which is the updated file?
- ❖ PC:
 - ❖ Web site
 - ❖ Does **Radiation under investigation** means TO BE CONFIRMED?
- ❖ Cryo:
 - ❖ Mail update