

Status of the Low Voltage Power Supply System

Emanuel Rauter HEC Group Meeting, January, 28th 2005

Contents:

- Production Readiness Review
- Radiation Test
- Preparation for ECC

Power boards by Wiener

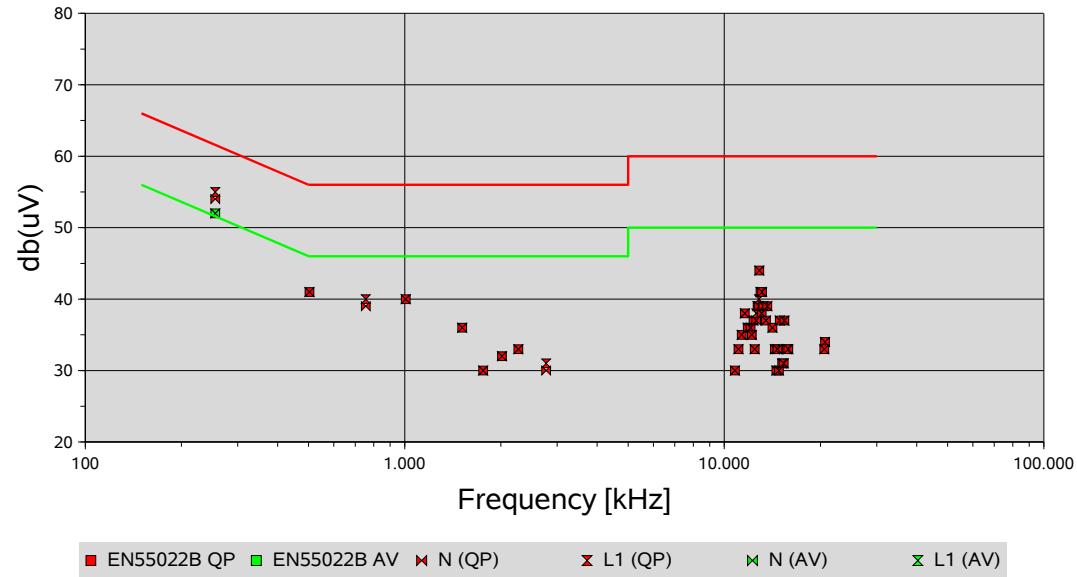
- 3 prototype Power Boards have been delivered for testing
- 15 Power Boards will be ordered
- 8 of these are needed in the LV-Boxes

Specifications:

- To have a safety factor of 100%, two DC/DC-converters for each output voltage should be put in parallel.
 - Achieved by design
- Output of DC/DC converters for redundancy are connected with diodes, the regulated voltage is the voltage before the diodes.
 - Achieved by design
- An output monitor signal for each DC/DC-converter shows the correct functioning and in case of an error gives a error message.
 - Achieved by design

- Over temperature shutdown of all DC/DC converters if the temperature is higher than 110°C at the hottest spot.
 - Tested to be OK
- Short and over current protection
 - Tested to be OK
- Output filtering for ripple and noise
 - Tested to be OK
- EMI filtering of DC inputs
 - Tested to be OK

EN55022 Conducted Noise

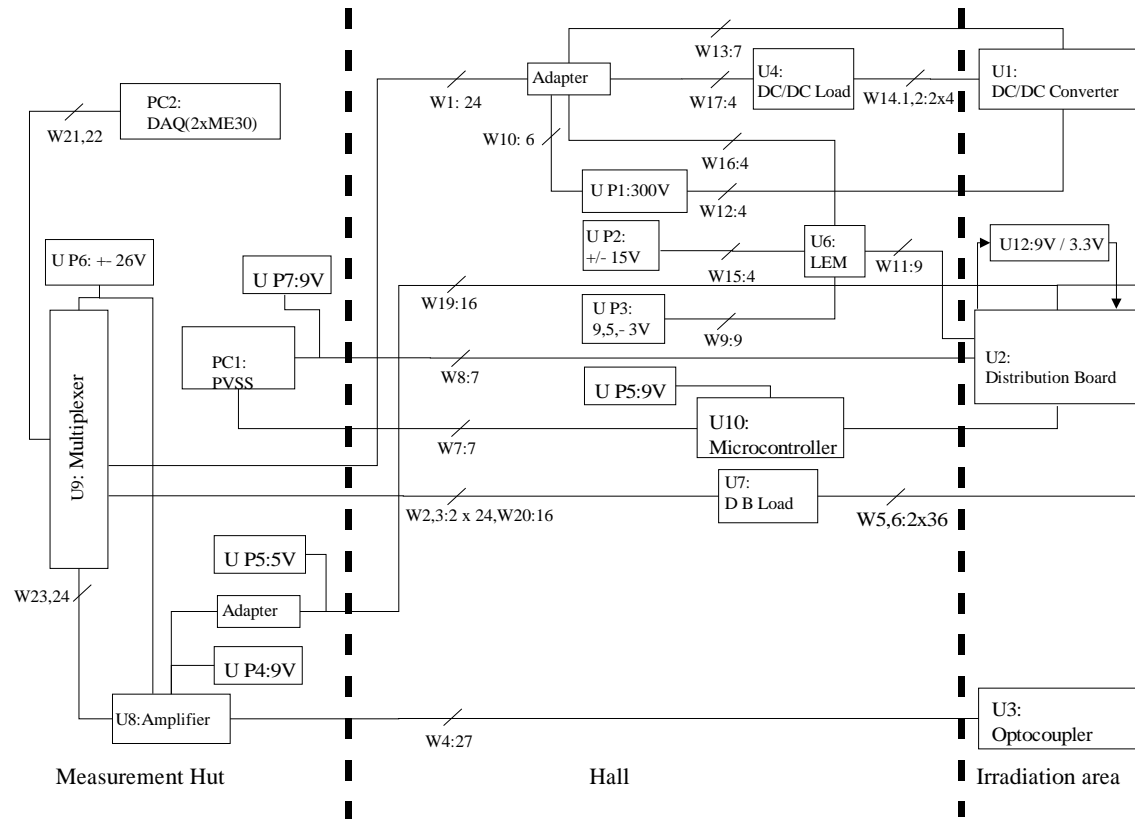


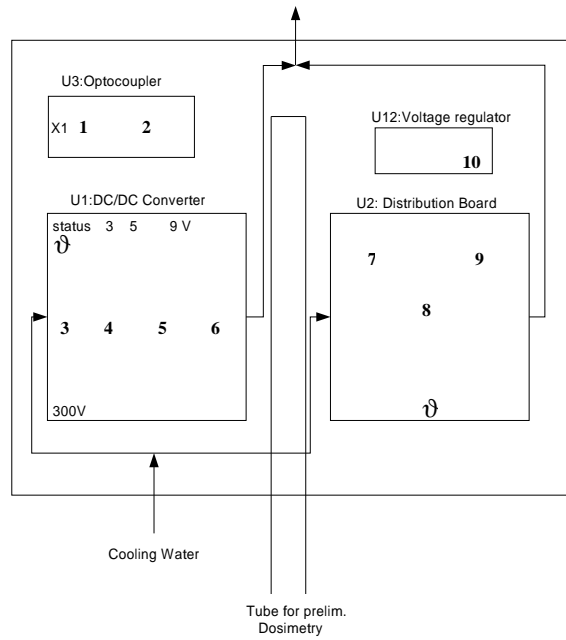
Conducted noise as measured by Wiener (L1 is the positive line, N is the ground line, QP stands for Quasi Peak, AV for Average).

- Efficiency better than 80% measured in front of the diodes for the connection of the converters.
 - Prototypes achieve 77% efficiency measured behind the diodes
- Operation with no load should be possible
 - Tested to work 4 hours
- " Power on " soft start; no current spikes at " power on "
 - To be checked

- Working under a magnetic field environment of 100 G (10 mT)
 - Shielding expected do work up to kG, but needs to be checked
- The values for the expected radiation environment dose (integrated over 10 years) changed due to corrections in the z position of the box:
 - TID 66.3 Gy
 - NIEL $6.23 * 10^{11} n/cm^2$
 - SEE $1.29 * 10^{11} hadrons/cm^2$

Radiation test set-up at JINR

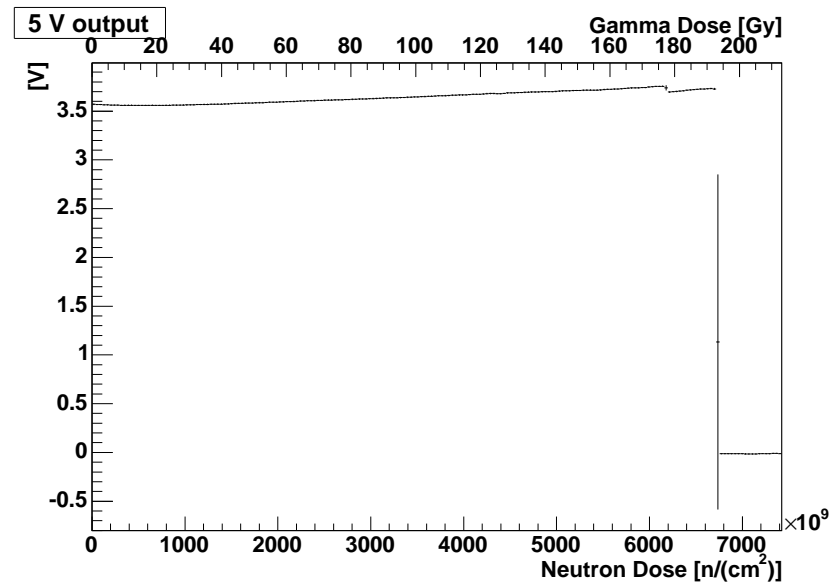
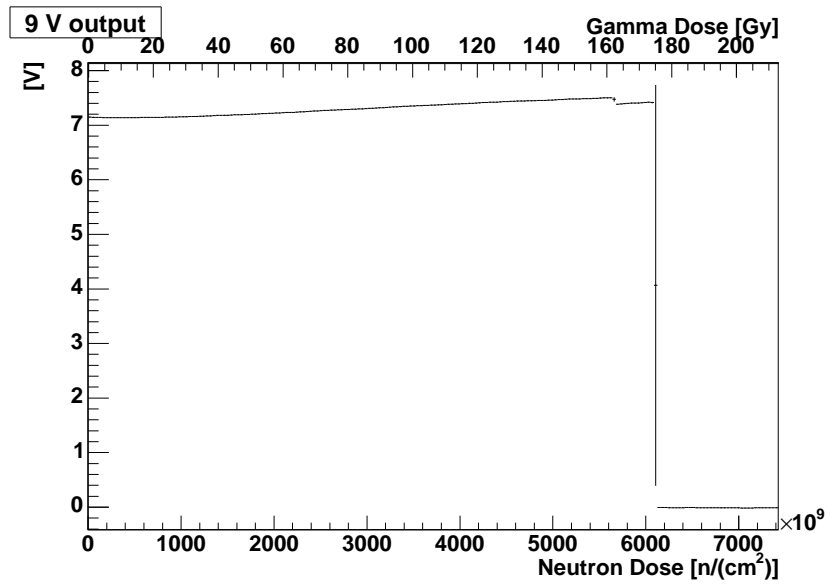


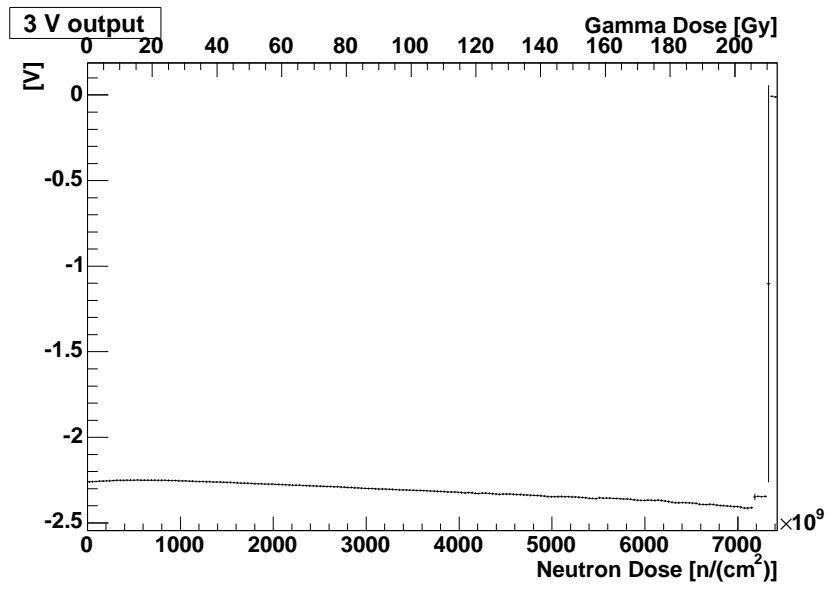


The preliminary fluxes are:

- $\gamma : 6.20 \text{ Gy/h}$

- $n: 6 * 10^7 \text{ n/cm}^2\text{s}$





ECC preparation

- DB are being checked
- Box is going to be assembled next week

=> Power Box ready for installation on February 7th