

## Minutes of the meeting of the SPS Upgrade Study Team on 25 February 2010

**Present:** G. Arduini, J. Bauche, F. Caspers, P. Chiggiato, R. Garoby, E. Metral, G. Rumolo, B. Salvant, E. Shaposhnikova, M. Taborelli, C. Yin Vallgren

**Excused:** E. Manher, S. Federmann

### • Task Force on SPS Upgrade

The Task Force on the SPS Upgrade, led by Volker Mertens, was created after the Chamonix workshop. The mandate and time scales of this Task Force were presented. According to Steve Myers and Volker Mertens the work of the SPSU Study Group should continue.

### • MDs related to the SPS upgrade in 2010

The 2010 MD requests covering different subjects related to the SPS upgrade were discussed:

- TMCI - threshold and cures

- effect of larger transverse emittances along the chain

- Beam losses and their connection to e-cloud

→ Can be checked from previous scrubbing runs (Christina)

- Push for maximum intensity in LHC injector chain - coordination needed.

The full list of submitted (to Elias Metral as MD coordinator) requests is attached.

### • Results from samples extracted during SPS shutdown. - M. Taborelli

The reasons for different ageing characteristics with venting of a-C coating in MBB magnet and liners were investigated.

Endoscopy of the coated magnet (MBB040) extracted from the ring shows many different traces of unknown origin. The situation will become more clear after opening the magnet. Note that coated magnets were vented during this intervention (magnet replacement).

Different coating systems were used for liners and for dipoles and the same for liners and the removable sample. This sample (in the C-magnet) was exposed to air during the shutdown work. It also shows an increase in SEY from an initial 1.15 to 1.5. It has a SEY variation in the horizontal direction with maximum SEY (1.55) in the middle (two humps) corresponding to the maximum exposure to the e-cloud (no coating on the opposite side). This area has higher presence of oxygen. The SEY on the edges is 1.3 - similar to the sample coated with MBB and stored in the pumping port.

No deterioration in SEY was observed for the a-C liner after irradiation (500 eV) with large dose in lab and venting.

The removable sample (from the C-magnet) was exposed to the e-cloud and the liner was not (or in much less degree, at least in the center from where the sample was taken). Another possible explanation is contamination of the a-C coating close to the StSt surface.

→ Can be checked by measurements of sample at the edge of liner.

No traces of conditioning with beam can be seen on the StSt liner (SEY of 1.7-1.9).

Paolo proposes to consider coating a a new vacuum chamber, which would be not radioactive, prepared in advance, baked, with heaters on the sides for future re-activation and insulated. Jeremie estimates the replacement of a vacuum chamber inside the magnet to cost  $\sim 100$  kCHF/magnet.

Fritz proposes to study in lab (bld. 867) multipacting of the a-C coated MBB magnet with a wire.

- The next meeting (joint with the Task Force on SPS upgrade) will be on **25 March 2010** at 15:30.

Preliminary agenda:

Collimation for high intensity LHC beams in the SPS - R. Assmann

TMCI threshold for LHC bunches in the SPS - B. Salvant

Latest results on coatings - M. Taborelli

E-cloud estimate from mw measurements - S. Federmann

Elena Shaposhnikova, 9.03.2010