

Collimator Design Meetings

Minutes of the meeting 49 (10/11/2004)

Present: Aberle, Assmann, Bertarelli, Kadi, Mayer, Perret

Minutes # 48: No remarks on previous minutes

REPORT FROM THE COLLIMATOR ROBUSTNESS TEST (RALPH)

1. Ralph briefly reported on the robustness test performed at TT40. The outcome looks **very successful**. Collimators jaws were impacted by 10 full intensity injection bunches without any sign of mechanical damage (5 bunches on each jaw) plus many more shots at lower intensity. Intensity was in the range of 2.5MJ/mm² (i.e. very close to Tevatron nominal intensity).
2. The only minor problem came from the temperature sensors which all eventually failed after some full intensity shots. The measured temperature increase after a single full intensity shot was in the range of 10°C, well in line with the calculations.

INVITATION TO TENDER: VISITS OF BIDDERS (OLIVER)

1. Two firms have so far visited CERN to witness the in-house production procedure for the collimator prototypes. The visits turned out positive for both firms who were able to gather useful information.
2. Oliver informed that the Purchasing Service (De Cat) has postponed the date for offer envelope opening to the 15th of November.

NEWS FROM TATSUNO (MANFRED)

1. Manfred presented some updated information obtained from Tatsuno for jaw materials (C/C and High Density graphite). He confirmed that the delivery time is 3-4 months from order (of which 4-6 weeks are for machining)
2. More details can be found at [TatsunoCTEAC150AC200p1.pdf](#), [TatsunoPhysPropHDGraphite.pdf](#)

DATABASE OF RAW MATERIAL TO BE ORDERED (OLIVER)

1. A detailed list (including ironmongery) is being prepared and continuously updated by Oliver. For each item a responsible is defined. Such a file will be soon available on Oliver's public directory.

COPPER TUBE MANUFACTURING (ALESSANDRO)

1. Alessandro informs that he launched a wide survey in order to find potential alternative suppliers of Cu-alloy pipes (Cu-Ni10 in particular). Out of many companies, one Italian firm has positively responded claiming they can manufacture Cu-Ni10 pipes at their exact section (9x9 ext. Ø6 int.) in less than three months. We are waiting for a written confirmation from their side.

AOB

1. Alessandro gave a short presentation on the Maximum jaw deformation during the 10s transient. The results show a clear degradation of the performances with the new non-symmetric energy distribution both for Graphite and C/C (for details see [CDM49_TransientAnalysis.pdf](#)). Graphite performs better than C/C, though the worsening of deflection with the latest energy distribution is much stronger than C/C. With C/C the maximum deformation after ~1s transient can be in excess of 300µm (outward with respect to the beam). Ralph stated that though this deflection is very high, the fact that the jaw surface moves away from the beam makes the scenario less worrisome since the main beam is not affected and the other downstream collimators should take over the loss of efficiency of the hottest one. This estimation should be confirmed by an updated calculation on the beam optics (**action** Ralph).
2. Roger presented the updated design of collimator main support. There are now 4 different designs (0°, 45°, 90° and 135°) which allow to position the collimator in any existing orientation ($\pm 10^\circ$ allowed from nominal orientation) and also permit to easily dismount each collimator. He also showed a new design for the vacuum pump post simultaneously supporting vacuum equipment for both beam pipes (design approved by Ch. Rathjen – AT/VAC).

3. Total number of collimator material to be ordered: the exact quantity to be cited in each material request for offer was raised. Ralph confirmed that the maximum quantity to be ordered must allow the manufacturing of 40 collimators with an extra average spare quantity of 5%. This spare quantity should be adjusted for each individual component. Anyhow, this figure (material for 40 + 2 collimators) is to be confirmed after discussion with Enrico.
4. A workshop test is foreseen to check the possibility to machine the tank cover directly from a 18mm plate (instead of 25mm). The plate has been ordered.
5. Updating of Action list (see below).

ACTION LIST to be followed up:

Divisional request for motors MS	#31	Oliver, Fabrice, Stefano
Contact fingers – model for tests top and side	#34	Sergio, Roger
Play between motor spindle and jaw	#34	Roger
Non-symmetric heating of vacuum flanges	#34	Vasilis, Oliver, Miguel, Rathjen
"Remote control" collimator exchange	#35	Keith, Roger
Radiation issues – heat evacuation, air duct, space, shielding		Ralph
Electrical insulation of motors from Tank	#38	Roberto, Roger
Detailed information on electrical plug-in and sensors (URGENT)	#45	Roberto
Detailed information on water plug-in (URGENT)	#45	Manfred
New Fluka simulation for 7TeV accident case	#47	Vasilis
Collimator item database	#47	Oliver
Required torque for motors	#47	Alessandro, Roger
Updated calculation on beam optics during transient	#49	Ralph