Collimator Design Meetings

Minutes of the meeting 48 (05/11/2004)

Present: Bertarelli, Hänni, Kadi, Mayer, Perret

Minutes # 47: Remarks on Carbone Lorraine C/C and graphite refer to the standard mass production. Better tailored products might be available “on demand” (with longer lead times) (Raymond).

REPORT FROM VISIT TO LNI (RAYMON, ROGER, ALESSANDRO)

1. Raymond reported on the visit to the swiss firm LNI producing precision cold-drawn copper pipes. The goal was to gain information on the possibility to produce the special tubes required for the collimator cooling circuit. The outcome was interesting though no “ready-on-the-shelf” solution was found.
2. As of today there are several options for the cooling pipes material:
    a. Glidcop (UNS C15715): this is the first favorite solution. Unfortunately NAH informed that Glidcop pipes cannot be obtained by them from normal extrusion and no pipe producer was found on US market. They propose to supply CERN a rectangular pipe blank from which to obtain the final shape (Alessandro). Main drawbacks of this option are: long delivery times (4 months for blank + cold-drawing), limited elongation (30%) and unknown erosion-corrosion resitance.
    b. CuNi10 (UNS C70600): this copper alloy is widely reputed for its erosion-corrosion resistance. Its thermal conductivity (50 W/m/K), though much lower than OFE’s, after first calculations, is still acceptable for the system. Overall, from the technical point of view it can be considered the best compromise. Its main drawbacks are limited elongation and difficult procurement.
    c. CuBe2 (UNS C17200): this is part of LNI standard program. Its properties seem to be halfway between OFE and CuNi.
    d. Cu-OFE ($O_2 \leq 5$ ppm) (UNS C10200). This is the prototype solution. Easy to procure and form. Main concern rests on the erosion-corrosion resistance: this alloy is not recommended for water speeds in excess of 1.5m/s.
3. According to LNI, all above options could be produced starting from a round pipe blank. Glidcop could be cold-drawn if a round pipe blank with wall thickness ~4 mm is made avaible. Cu-Ni is a good solution but they predict long and difficult deliveries due to the limited quantity required. Cu-Be is a material they are acquainted with: easy to draw and shape. Unfortunately no material is on stock at LNI.
4. A proposal will be done by LNI in week 46 based on the first feedback from their suppliers.
5. In the meanwhile a test campaign will be launched on samples of CuNi and CuBe with S. Mathot and S. Sgobba to check grain growth after heat treatment, evolution of mechanical properties etc.
6. The search for potential suppliers should be enlarged also involving Logistics people (Saint-Jal) (**action** Alessandro).
7. NAH should be re-contacted to assess the possibility to order Glidcop round blank (**action** Alessandro)

AOB

1. Manfred informs that R. Losito has found a radiation resistant motor (up 10 MGy) with limited torque available (0.7Nm)
2. The maximum torque necessary should be recalculated for the worst case, taking into account the metallic jaws (**action** Alessandro)

ACTION LIST to be followed up:

Divisional request for motors MS	#31	Oliver, Fabrice, Stefano
"Plug-in" position control unit	#32	Roger, Fabrice

Drilling holes after phase one – grooves in tunnel floor	#33	Oliver
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 plug-in	#36	Oliver, Fabrice, Roger
Preparation of all raw-material list and order (**URGENT**)	#40	Oliver, Raymond
Detailed information on electrical plug-in and sensors (**URGENT**)	#45	Fabrice, Roberto
Detailed information on water plug-in (**URGENT**)	#45	Manfred
New Fluka simulation for 7TeV accident case	#47	Vasilis
Collimator item data-base	#47	Oliver