

Minutes

EN/MME meeting for HL-LHC CRAB CAVITIES

Wednesday, the 29th October 2014

Room 376/1-020

Scope: regular meeting for the HL-LHC CRAB CAVITIES (WP4) Project at EN/MME.

Attendees: Luis Alberty, Ignacio Aviles-Santillana, Rama Calaga, Ofelia Capatina, Teddy Capelli, Federico Carra, Paula Freijedo-Menendez, Norbert Kuder, Raphael Leuxe.

General

Next Niowave technical review video meeting – Friday, October 21st, 376/1-020 at 15h30.

Paula asked for the thicknesses of niobium that shall be qualified, and Ofelia confirmed that we shall be qualified to butt weld in 4, 3 and 2 mm niobium sheets (4 and 2 mm are for HOM fabrication).

Raphael reported that he contacted the survey team, and that two techniques will be used to accurately monitor the position of the dressed cavities:

- a) Wire measuring system (capacitive sensors);
- b) Fixed optical fibres with 'moving' targets.

Capacitive sensors shall be 4 by cavity (2 directions), optical targets 6 (3 directions), to be divided for the two extremities (beam axis wise). Optical targets and capacitive sensors shall be accurately positioned with respect to the beam axis. Raphael showed how these instruments could be linked to the beam axis flanges of the cavities. This would involve bolting the optical targets directly to the CF flanges and hold the capacitive sensors on extension arms, these connected to the flanges.

The design is under development, and first drawings will soon be issued. Luis mentioned that SS bolted connections are often problematic under such conditions (degreased surfaces, silver-coated threads, threaded holes out of tolerance, etc...) and replacement of a damaged flange would not be possible. So, he suggested that a boomerang shaped part, which would be fitted around the SS flanges, could be used to fix all sensors, allowing for accurate positioning and ease of replacement in case of problems. Luis and Raphael will further investigate this possibility (Action->Luis, Raphael).

Raphael also informed that the installation of both wires and optics will require openings on the thermal shield. This might be a drawback for thermal efficiency, as every opening behaves as a black body, to be taken into account on the 2K Helium budget.

Rama will check if the optical fibres are compatible with the radiation environment of SPS (Action->Rama).

Ofelia informed that SPS tests don't require positioning; only monitoring. For LHC, adjustments will be made via the supporting system.

Regarding the titanium bellows, the company VAT will be at Cern aiming at technical discussing feasibility and reliability issues, related to both materials and welding details.

Luis informed that he ordered the titanium products for helium vessel feasibility tests (ASTM B265 grade 2, t=15 mm) and that they will be soon delivered at Cern (week 45). Rama encouraged opening a new job at the Central Workshop for all activities related to feasibility tests, in view of regrouping materials and manpower. The budget code to be used is 69841. Luis will contact Jean-Pierre Brachet in view of opening the new job (Action->Luis)

DQW

Raphael is working on the preliminary feasibility drawings for the DQW helium vessel. The lateral thickness of the vessel is 15 mm, as top and bottom are 30mm thick. Drawings for the workshop will soon be issued. Raphael will also check if the 3-D model of the helium tank was sent to Thomas Jones (Action->Raphael).

Binping has released the latest version of the HOMs in EDMS, Teddy will take care of finalizing the remaining design (mostly filter connectivity and SS capsule design). He will also check the impendency of the line with Eric Montesinos. (Actions->Teddy). A strength assessment for thermal contraction will be carried out by Norbert (Action->Norbert).

The order of niobium products aiming at prototyping the HOMs was recently issued.

RFD

HyeKyoung asked by email if the RFD specification drawing could be updated for next Friday meeting. The only features to be changed would be the thickness of the reinforcement plates, which were reduced from 8 to 6.35 mm. It was decided to ask for the parametric dimensions of the cavity, since each time a drawing is done from a 'non-living' .stp file, and modifications are made on the 3-D, the link between the dimensions expressed on the drawing and the model are lost, requiring close verification, as mistakes are common. Luis was asked to take care of this request, as well as, suggest a discussion meeting for next week (Action->Luis).

For the HOM, Teddy will integrate the HOM + cable routing on the RFD cavity 3-D model (Action->Teddy).

Minutes taken by Luis Alberty