7th Summary of Meeting for S1-Global module design, Cryomodule and Cryogenics (20090203)

Date: 2009/02/03
Time: 23:00-23:30 (Japan Time)
Attendant: Jim Kerby, Tom Peterson, Carlo Pagani, Paolo Pierini, Serena Barbanotti, Akira Yamamoto, Hitoshi Hayano, Tetsuo Shidara, Hirotaka Nakai, Norihito Ohuchi

Agenda

1. Brief report about visit to Zanon (Norihito Ohuchi)
2. S1-global module: KEK-INFN-ZANON agreed design (Serena Barbanotti)
3. Date and discussions at the next meeting (All)

Discussion

(1) Brief report about visit to Zanon (Norihito)

・ Norihito Ohuchi, Kiyosumi Tsuchiya and Kenji Ueno (KEK) and Serena Barbanotti (INFN) visited to Zanon at January 27, and discussed the specification of the module-C design with Giorgio Corniani and Giovanni Basoni (Zanon).

・ Specifications of GRP, vacuum vessel, thermal radiation shields, adaptor flanges and openings on the vacuum vessel were confirmed.

・ The 1st version of the manufacturing drawings will be completed by Zanon in two or three weeks.

(2) S1-global module: KEK-INFN-ZANON agreed design (Serena)

・ GRP design

1) Final length of GRP (including reduction flange to 76.3 mm pipe) is 6000 mm.
2) Final length of the GRP plus the reduced pipe is 7000 mm (500 mm reduced pipe for each side).
3) GRP 312 mm pipe overlength from vacuum vessel end flange is 100 mm at each side. Reduced pipe overlength from vacuum vessel end flange is 600 mm at each side.
4) KEK defines the thickness of the reduction flange from 312 mm pipe to 76.3 mm pipe.
5) Zanon produces and installs the reduction (flange and pipe) to the 76.3 mm pipe (schedule 10 standard pipe).
6) Longitudinal position of the shapes on the GRP is calculated from the vacuum vessel coupler openings by INFN.
7) Gate valve support shapes have XFEL design and are positioned at 100 mm from GRP 312 mm pipe end. The position is fixed, while the design could be slightly modified together with cavity groups (at FNAL and DESY).
8) The shape profile will be slightly modified by Zanon to adapt to the new WPM position. KEK requires additional holes on the shapes.
9) GRP has 5 layers of MLI. Any sensor needed by KEK has to be provided and installed at Zanon before the MLI installation.

・ Thermal shields overlength

1) Distance between 4.5 K shield and vacuum vessel: 100 mm at each end.
2) Distance between 70 K shield and vacuum vessel: 50 mm at each end.
3) The coupler openings on the shield lower parts are the same as TTF.
4) The aluminum pipe overlength from each end of the two shields is 500 mm.

・ Piping and module cross section

Main changes with respect to TTF type 3+:
1) WPM position
2) 5 K forward line and copper cable pipe position

3) 5 K and 70 K return line (Al pipes) diameter can be reduced (> 22 mm) or profile can change (different fin design).
4) 2.2 K forward line has been removed.
5) Pipes standard overlength is 500 mm from the vacuum vessel end flange on both sides.

- WPM position and support design
  1) Positioning of WPM support is fixed: machined horizontal plane is aligned with GRP axis, machined vertical plane is at 232 mm from GRP axis.
  2) WPM sensors, holders and connecting pipes are provided by KEK before final preassembly of the module in Zanon. WPM cables will be installed at KEK.
- Others
  1) The invar rod will be fixed to the shape (cavity support leg) closer to the fixed post.
  2) The vacuum vessel has 3 standard flanges ISO 160F; inner diameter of the opening is 139.8 mm.

Next meeting date

Meeting Date: 17 February 2009 23:00 (Japan time), 8:00 (FNAL), 15:00 (INFN and DESY)

Discussion items

- Heat loads in the cryomodule
- Sensors assembled in the S1-Global cryomodule
- Preparation status of STF module-B cold tests
- Cold test of FNAL-CM1