

21th Summary of Meeting for S1-Global module design, Cryomodule and Cryogenics (20091013)

Date: 2009/10/13

Time: 22:00-23:00 (Japan Time)

Attendant: Jim Kerby, Tug Arkan, Serena Barbanotti, Carlo Pagani, Eiji Kako, Hirotaka Nakai, Hitoshi Hayano, Tetsuo Shidara, Takayuki Saeki, Norihito Ohuchi

All presentations are unloaded in the INDICO site:

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confid=4220>

Agenda

1. Discussion cavity assembly at KEK (Eiji Kako)
2. S1-G Module-components (Norihito Ohuchi)
3. STF Module-B thermal test results (Norihito Ohuchi)

Discussion

(1) Discussion cavity assembly at KEK (Eiji Kako)

- Shipping fixtures for transportation of cavities.

Transportation route of fixtures with cavities: FNAL→DESY(Oct), DESY→KEK(mid.Nov), KEK→FNAL(end Nov.), FNAL→KEK (mid. Dec.)

Cost of one path = 500 k Yen, the required time for one path = 10 days (company estimation)

C: For the FNAL side, there is no problem in this transportation proposal. FNAL can ship the fixtures to DESY at mid. of October.

- Cavity support post fixture.

KEK will prepare the only indispensable tools, and then KEK needs the drawings of cavity support post, bellow holder, and gate valve holder with alignment fixture.

C: Tug will send the drawing of these components.

- Cavity alignment tools in the clean room.

KEK will prepare the jigs for interfaces of the FNAL alignment tools (cavity rotation).

C: Tug will send the drawing of these components.

- Cleaning gate valves.

Lutz in DESY is preparing the instruction document for cleaning the gate valve, and Lutz will send the document this week. If necessary for studying this process, 1 KEK personnel with 1 gate valve should go to DESY.

- Ionization gas blower and particle counter.

KEK already ordered the gas blower gun, and the particle counter was prepared and working in STF.

- Cavity assembly work in clean room, tuner and magnetic shields assembly works, and installation of 4 warm couplers.

C: This assembly work should be discussed in the Webex meeting in November.

- Conditioning of 4 TTF-III couplers.

In the GDE meeting at Albuquerque, Chris Adolphsen in SLAC proposed to do the conditioning two FNAL couplers, but there is no confirmation of the conditioning process for the DESY couplers by DESY.

- Meeting for assembly work at KEK.

KEK will organize the meeting of the cavity assembly in STF.

From FNAL, Jim will come to KEK during the week of 9-13 November.

- Important issues

Contact person for cavity transportation: KEK (Eiji), FNAL (Tug), DESY (Axel is proposed)

Schedule of cavity preparation

Participants of the Video/Webex meeting at 11 November

Discussion items: (1) cavity assembly, (2) tuner assembly and testing, (3) coupler assembly and processing, and (4) getting the conclusions for these items.

C: From FNAL, Tug, Harry and the appropriate personnel will participate in the Video/Webex meeting at November.

(2) S1-G Module components (Norihito Ohuchi)

- Beam pipe and gate valves between Module-A and C

Because of no beam, simplifying the assembly of two modules and the difficulties of cleaning gate valves, KEK cavity group proposed that the cavities in the Module-A and C will not be connected. The cavities are closed with the blind flanges. The gate valves and the beam pipe will not be assembled between two Modules.

- Bellow pipe between the KEK gate valve and the FNAL cavity

In the KEK internal meeting after the ALCPG09 GDE meeting, the KEK cavity group proposed that the whole set of beam bellow pipe with flanges is manufactured by the KEK cavity group. KEK need to get the blind flange from FNAL for checking leak tightness.

C: In the picture, the flange between the cavity and the beam pipe is rotatable, but FNAL will not use the rotatable flange and it is risky for cavity assembly.

Q: How is the gate valve supported?

A: The gate valve is supported from the gas return pipe with C-clamps and needle bearings.

Q: For designing the bellow pipe, we need information about the FNAL cavity at this location. Is the cavity long or short? How about the AES-2? Is it the long type? If you select the AES-2 cavity at this location, KEK can solve this problem.

A: The AES-2 is the long-short type, but FNAL does not decide the two cavities for S1-G. The AES-2 will not be vertical-tested before November 11.

C: The pipe part of the component can be cut and welded after deciding the FNAL cavity.

Q: When will FNAL do the vertical test?

A: The vertical test stand will be in line at November 11, and the first scheduled cavity is Accel-11. The Accel-11 is the short-short cavity.

C: The pipe part of this component should be designed as the longer length case (the short-short cavity). In case of the long-short cavity, KEK cuts the pipe in the proper length and welds then again. And in the design of the bellow pipe, the screw protection should be included at vacuum check.

- Vacuum pipe for input couplers

The KEK cavity group prepares the vacuum pipe for input couplers, and the bellows between this pipe and input couplers are prepared by FNAL and DESY. For manufacturing the pipe, KEK needs the drawing the connection flange.

C: Tug will send the drawing to KEK (Norihito) and DESY(Lutz) for double checking the dimensions.

- Cutting and welding processes of liquid helium supply pipe

The liquid helium supply pipe has the flange and the blind end. The cavities are transported to KEK with the conditions of cutting the flange and the blind end of this pipe.

FNAL supplies the reduction piece of pipe between the DESY and FNAL helium supply pipes.

- Terminal ports on Module-C vessel

On the Module-C, two terminal ports are on the vessel. 624 signal wires can go out from the vessel via feed-throughs. The port location was shown in the slide for information of routing the wires.

- Flanges of T-shape port

The signal wires for the two flanges are considered to be Piezos, e⁻ pickup couplers, cavity HOMs, cavity pickups and stepping motors. KEK needs the information of the number of wires and the terminal feed-throughs.

C: FNAL will supply the terminal information of CM2.

(3) STF Module-B thermal test results (Norihito Ohuchi)

- Please see the presentation file.

• The cold tests by the Module-B with 5K shield and without 5K shield were performed from June 15 to July 3, and from August 25 to September 11.

• The difference of the heat load at the dummy cavity vessels at 2K with 5K shield and without 5K shield was 0.8 W. The dummy cavity vessels did not have the super insulations (SI), and the stainless surfaces of the vessels suffered the radiation heat loads from 5K and 80K shield plates.

- The thermal analysis on this problem is now going with the 3D model by ANSYS.

Q: What was the temperature condition of the remained 5K upper shield and the gas return

pipe?

A: The remained shield was cooled with liquid helium at 4.2 K, and the gas return pipe temperature was almost 2K.

C: For cooling couplers and support posts, the 5K and 70K intercepts are important to reduce the conduction heat loads. The special intercept design must be re-designed for the system.

Next meeting date

Meeting Date: 27 October 2009 22:00 (Japan time), 8:00 (FNAL), 15:00 (INFN and DESY)