Fermilab

SDC SOLENOID DESIGN NOTE #174

TITLE: Notes from working group meeting on April 2, 1992

AUTHOR: Ron Fast

DATE: Apr 8, 1992

These are the notes I took during our meeting; what viewgraphs I have are attached to the end of this design note. In attendance were: Yamamoto, Kephart, Stanek, Fast, Grozis, and Charles Collins (SSCL).

1. Technical Design Report

Copies will be available at the SDC collaboration at Fermilab, April 9-11. Ron will get a copy and sent it to Akira.

2. Presentation at the PAC review on May 5

2.1 Bob Kephart is to try and find out who, specifically what magnet experts, will be on the review panel. Send this information to Akira.

2.2 We worked on an agenda for the solenoid presentation:

9:00 - 9:30	Introduction, physics goals, general requirements (Bob Kephart)
9:30 - 10:30	Design of detector solenoid (Akira Yamamoto)
10:30 - 11:00	Break
11:00 - 11:30	Design of detector solenoid, continued (Yamamoto)
11:30 - 12:00	Cryogenic system, helium refrigerator, transfer line and bus route, effect of VLPC (Andy Stefanik)
12:00 - 1:30	Lunch
1:30 - 3:00	R&D, prototype (Yamamoto, Kephart/Grozis)
3:00 - 4:00	Cost and schedule (Rich Stanek, Yamamoto)

2.3 We agreed to exchange copies of the transparencies we will use by April 20.

2.4 We agreed to meet during the afternoon of May 5 for a dry run of our presentation. "Dry run" means to go through our transparencies quickly.

2.5 We agreed to think up "hard" questions which we might be asked by PAC members or experts.

2.5.1 Why is E/M so low--so high?

2.5.2 Why did you work so hard and take risks to get 1.2X0?

2.6 In the presentation we need to account for the effect of the VLPCs on the solenoid. Akira thinks that the solenoid-VLPC separation should occur at the surface and that there should be two storage dewars there, one dedicated to the solenoid, the other dedicated to the VLPCs.

2.7 We agreed that Grozis or Kephart will cover both honeycomb and isogrid in the prototype part of the presentation.

2.8 The cost and schedule part will be presented by Rich Stanek. Akira will try and supply Rich more complete cost information in the next month. The schedule presented to be that in the TDR.

3. Calorimeter

In the afternoon, Dan Green, Larry Bartoszek, and Bill Foster joined the group for a discussion of the cryostat-calorimeter interface.

3.1 Coil to iron separation

3.1.1 The thickness of the base-line design of the EM section of the end cap calorimeter is given as 327 mm on page 6-41 of the TDR.

3.1.2 Bill said that there have been suggestions that the space at the end for attachments and cables be reduced from the present 75 mm.

3.1.3 It appears that the axial coil to iron spacing is about 640 mm. Does this give acceptable forces and adequate field uniformity?

3.2 Number of cold mass supports vs number of attachments to calorimeter

The present Yamamoto/Toshiba design has 12 or 14 axial supports and six radial supports, all of which are fastened to the bulkheads and transmit loads to them. The issue is that there are only eight attachments to the calorimeter according to the TDR, although there could be 16 attachments. This means that the bulkhead will carry loads circumferentially, something we said at the beginning it would not do. The thickness of the bulkhead could be chosen to do this, but it would be thicker than if it were not carrying loads.

Akira agreed to study this issue further.

3.3 Answer to "hard question""

Dan agreed to look at the effect that the radiation thickness has on calorimeter performance--he will consider 90^{o} radiation thicknesses of 1.2, 1.4, and 1.6 X_0.

4. Prototype Vacuum Vessel

4.1 Nozzle in isogrid shell

Akira asked that the nozzle in the outer vacuum shell be as short as possible to facilitate magnet assembly. The outer diameter of the nozzle will be 12.75 inches (323.85 mm) and it will extend 2 inches (50 mm) out from the shell.

The nozzle will terminate in a bolted aluminum flange with an O-ring groove. A blind (blank) aluminum flange will close the nozzle.

4.2 Bulkheads

4.2.1 Thickness of bulkheads to be 31 mm (1.220") +/- 0.02 mm.
4.2.2 Aluminum alloy is 5083.
4.2.3 Fermilab will face both sides of both bulkheads.
4.2.4 Fermilab to bore access holes for the radial supports, diameter to be confirmed by Akira no later than May meeting.
4.2.5 Fermilab will blind tap holes on the outside for covers on access holes.
4.2.6 There are seven access holes and covers.
4.2.7 Fermilab might blind tap holes on inside of bulkheads for radial attachment blocks, Akira will confirm if so and provide hole pattern.
4.2.8 Who will bore the holes for the axial support attachments is an open question at the moment.

5. Refrigeration Requirements for VLPCs

Andy and Charles Collins will try to get more details from the tracker group at the Fermilab collaboration meeting.

The next meeting of the solenoid working group will be on May 4th at the SSCL, probably in the afternoon. Persons traveling to Dallas for the PAC presentation should plan to arrive by about noon.

ACTION ITEMS

1. Ron--Send Akira a copy of TDR. (TDR mailed April 6.)
2. Bob--Find out who is on PAC panel and inform Akira.
3. All--Send copies of PAC presentation viewgraphs to other presenters by April 20.
4. All--Think up "hard" questions, get them to Bob and Akira.
5. Akira--Send Rich more cost information for May presentation.
6. Akira--Study issue of number of supports and attachment blocks. Fax received from Akira on April 8 is attached.
7. Dan--Calculate calorimeter performance for several values of X_0.
8. Akira and Chuck--Study and resolve several bulkhead issues.
9. Charles and Andy--Get more details from tracker people about heat load and cryosystem for VLPCs.

FAX COVER SHEET

1992, Apr. 7
20:00

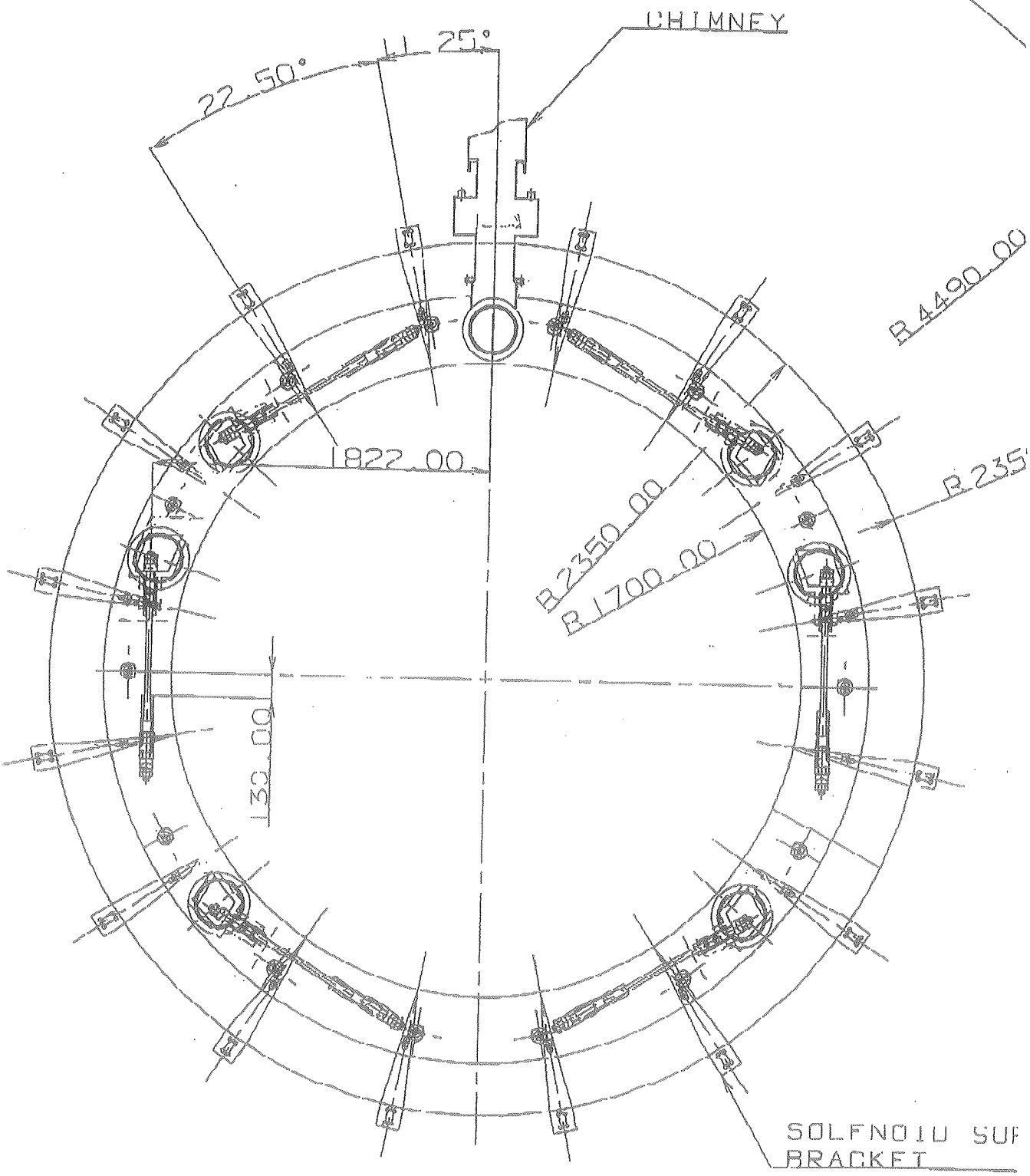
To: Dr. Ron FAST

Fax No. 001-1-708-840-3867

From: Akira Yamamoto

Physics Group
KEK, National Laboratory for High Energy Physics
1 - 1 Oho, Tsukuba-Shi, Ibaraki-Ken, 305 Japan
Fax No. 81-298-64-~~3580~~ 7831
Telex 3652-534

COVER SHEET + 1



BARREL CALORIMETER