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**Date:** June 10, 2002

**To:** Distribution

**From:** Richard Thomas, Chairman, Cryogenic Safety Committee

**Subject:** Review of Minutes of the Cryogenic Safety Committee Meeting of 07 May 2002

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# Memo

You will find attached the final copy of the CSC Minutes of the meeting of 07 May 2002. No comments were received on the draft version, so the final version is the same as the draft that was circulated earlier.

RT:rt

Attachments

**Distribution:**

T. Sheridan  
M. Harrison  
D. Lowenstein  
G. McIntyre

✓ S. Plate  
W. Glenn  
G. Citver

**Members of the Cryogenic Safety Committee:**

S. Kane, Bldg. 510A	P. Kroon, Bldg. 510C
M. Gaffney, Bldg. 902A	M. Rehak, Bldg. 902A
J. Muratore, Bldg. 902A	K. C. Wu, Bldg. 902A
M. Woodle, Bldg. 725C	M. Iarocci, Bldg. 1005S

# Memo

**Date:** May 7, 2002

**To:** Distribution

**From:** Richard Thomas, Chairman, Cryogenic Safety Committee

**Subject:** Minutes of the CSC Meeting of 02 May 2002

- 1) Actions of the CSC since the Meeting of 21 February 2002
- 2) Review of the Re-Liquefier for the RHIC Liquid Storage Area

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**Members Present:** Richard Thomas (*Chairman*), M. Gaffney (*ex-officio*), M. Iarocci (arrived late), P. Kroon, M. Rehak, M. Woodle, and K. C. Wu

**Members Absent:** M. Iarocci, S. Kane

**Others Attending:** J. Muratore (*Recording Secretary*), P. Cernigliero, G. Citver, A. Etkin, W. Glenn, R. Karol, P. K. Feng, A. Nicoletti, A. McNerney, J. Scaduto, M. Van Essendelft

The meeting was called to order by the chairman at 3:02 p.m. in Conference Room 63 of Building 902. The members of the Cryogenic Safety Committee were joined by representatives of the Collider-Accelerator Department and members of that department's Safety Review Committees for the review of the RHIC re-liquefier.

## 1. Actions of the CSC since the Meeting of 21 February 2002

The following items were reviewed by the committee without a formal meeting. Instead, documentation concerning the items was sent to all the members. The members then individually sought clarification of the issues with the cognizant engineers and exchanged the information obtained with other members of the committee through email. Finally, the Chair determined whether the committee wished to recommend approval without holding a meeting or whether a full meeting of the committee needed to be scheduled instead.

A majority of the members of the CSC recommended approval of the following two items. No member requested a full meeting nor did any member recommend that either item not be approved.

A. The Spin Rotator Transition Piece as presented by Gary McIntyre of the C-A Department. (See attachment.)

B. The Phase Separator of the LHC D1 Magnets as presented and clarified by Steve Plate of the Superconducting Magnet Division. (See attachment.)

## 2. Review of the Re-Liquefier for the RHIC Liquid Storage Area

Gregory Citver, Project Engineer for the C-A Department Cryogenics Systems Group, presented information regarding the proposed re-liquefier system for the RHIC Liquid Storage Area, most of which would reside in Building 1005E.

Other members of the C-AD Cryogenics Systems Group and C-AD Safety Review Committees were present and answered questions when they came up during the course of the presentation.

Mr. Citver started by pointing out that this facility would save C-AD \$2,000/day in lost helium gas during RHIC shutdown periods. He then presented a schematic showing the main components of the system, which includes a compressor, refrigerator, purifier, liquid helium storage tank, liquid nitrogen storage tank, nitrogen gas tank farm, and associated piping and valves. It was pointed out by the chairman, R. Thomas, that the storage tanks had already been reviewed and approved at past meetings of the CSC.

Most of the other system components, such as the M1660S refrigerator, the compressor, and the purifier, are from industrial vendors and comply with safety requirements. Safety analyses for the various pipes, valves, and sensors have been done and were also shown to meet safety requirements.

The following possible safety hazard scenarios were proposed and their resolutions were presented:

1) If there is a loss of cooling water, the compressor will automatically shut down due to the sensing and action of temperature and pressure switches in the circuit. Pressure relief valves will mitigate any over-pressure problems. Committee members suggested that all such switches and valves be periodically tested and C-AD personnel replied that a regular maintenance schedule would be followed. Questions were also asked at this time about:

- a) the heat load on the building: three new fans were being added;
- b) noise levels: a noise level survey will be conducted and the results posted;
- c) ODH for the building: discussed later; and
- d) oil spillage: low volume of oil will be handled by existing oil tray.

2) If there is a loss of power, the compressor will shut off.

3) If there is a loss of vacuum, the refrigerator shuts off.

Mr. Citver then presented information on the new pressure relief valves, which open at 80 psi. This setting far exceeds the requirements of the piping, which is rated to 200 psi.

The piping for both the liquid nitrogen and the helium will be provided by outside vendors who are responsible for testing and showing compliance with the design specifications. *Statements of Work* that outlined the requirements for the helium system and for the nitrogen system were distributed.

The final issue concerned the ODH classification of Building 1000E with the re-liquefier system in operation. Oxygen deficiency can result from a leakage of either helium or nitrogen into the building's west end, which is sealed off from the rest of the building. An ODH calculation by R. Karol of C-AD was done for the worst case of a 2500 CFM nitrogen leak into the west end and a conservative estimate of one pressure failure every 168 hours. This showed that an ODH 0 classification is met by having one 10,000 CFM exhaust fan. There will be two redundant fans installed.

**Recommendations:**

1a. Review of the RHIC Spin Rotator Transition Piece (Gary McIntyre)

This item was reviewed through the exchange of documentation and email. The CSC recommends approval.

1b. Review of the Phase Separator for the LHC D1 Magnet (Steve Plate)

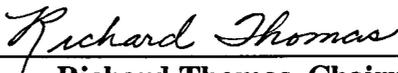
This item was also reviewed through the exchange of documentation and email. The CSC recommends approval.

2. Review of the Re-Liquefier for the RHIC Liquid Storage Area (Gregory Citver)

The CSC recommends approval of the RHIC Re-liquefier as presented.

The meeting was adjourned at approximately 4:05 p.m.

Approved:

  
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Richard Thomas, Chairman, CSC

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Attachments

**Distribution:**

T. Sheridan  
Members of the Cryogenic Safety Committee  
M. Harrison  
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