STAR Safety Memo

To: R Brown, W Edwards, D. Fritz, Y. Makdisi, H. Matis, J. Rasson, J. Sandberg, H. Schulman, H. Wieman

From: Asher Etkin

Date: December 20, 1993

Subject: Informal discussion of TPC safety issues - **REVISED**

Participants:- R. Brown [BNL], W. Edwards [LBL], A. Etkin [BNL], D. Fritz [LBL], Y. Makdisi [BNL], H. Matis [LBL], J. Rasson [LBL], J. Sandberg [BNL], H. Schulman [BNL], R. Stone [LBL] and H. Wieman

On July 16, 1993 an informal meeting took place at BNL to discuses potential safety concerns with the present STAR TPC design. R. Stone discussed the mechanical design of the TPC including the mounting system, H. Wieman described the high voltage system and A. Etkin spoke about the gas system. The associated electronics and laser systems were not considered.

The TPC mechanical structure presented is designed to permit personal to work inside the outer field cage supported on a bridge supported from the end wheel structure. An ANSYS model of the TPC end wheel were used to insure it would not deflect excessively[STAR notes 97 and 110] under the load of being lifted or supporting a person on the bridge. The deflection of the surface of the TPC ends was limited to 100 μm for a pressure differential of 5 mbar. It was generally agreed that this appears to be a conservative design. There was a discussion of the design of the TPC mounting system which has been extensively analyzed. A formal report[STAR note 117] of this study has been submitted to RHIC for review.

There was also a discussion of the high voltage system in which it was determined that the power supplies and cables to be used for the sectors will meet the requirements of the RHIC SEAPPM for low current high voltage under 5KV. The drift high voltage will require further review after the final design is completed. Although LOTO is not required for personal safety in the sector high voltage system it was determined that a formal system of control was required to protect

equipment. Given the stored energy in the drift high voltage system formal procedures including LOTO will be required.

During the discussion of the gas system it was determined that the system appeared to meet the applicable standards but would require additional reviews as the design developed. It was also determined that formal operational procedures would need to be developed. Particular care would be required during startup and shutdown to prevent the production of a dangerous mixture in the TPC. There would also have to be a procedure to prevent the application of high voltage unless the correct gas mixture is in the TPC.

cc: File

attachments: [file only]
I] STAR note 97
II] STAR note 110
III] STAR note 117