Minutes of meeting: Radiation Safety Committee, sub-committee

Date: Wednesday, July 29, 1998

Present: W. Mackay, R. Marascia, S. Musolino, K. Reece, A. Stevens

Subj: Shielding and Access Configuration at 12 O’clock

The meeting began with a visit by the sub-committee to the RHIC 12 o’clock intersection region (IR). The current shield configuration was examined as well as large (5 ft. diameter) cryogenic pipe penetrations emerging from the berm. (Identical penetrations are also present at 10 o’clock).

A. Stevens presented the results of calculations for the shield wall configuration which exists in this area, which are attached to these minutes. R. Marascia presented a design for enhancing the shield wall on the Ring Center side of the IR, which was included in the configurations calculated in the attachment. Also presented by Stevens was a plan to fence the area (requiring approximately 800 ft. of fence with locked gates).

If a person would violate postings and climb the fence at the same time that a fault occurred at 4 times design intensity, the potential dose (assuming x2 quality factor) at worst case locations are (1) 95 rem at the cryogenics penetration, (2) 8 rem on the ring-center side with the additional shield presented by Marascia, and (3) 20 rem on the side opposite ring-center with only the existing shield. The latter two numbers are at human height which are a factor of 1.7 lower than the beam-height numbers in the attachment. The sub-committee was of the opinion that additional measures for radiation shielding and access near the cryogenics penetrations are required and that additional shielding on the side opposite ring-center would be prudent.

The subcommittee recommendations which must be implemented prior to the beginning of the physics run in November, 1999 are the following:

1. The shield design presented at this meeting by R. Marascia including the additional base and blocks on the ring-center side must be in place (CK-12oclock-1).

2. The additional fence (attachment) presented by A. Stevens must be in place. The fence must be locked and be posted appropriately (CK-12oclock-2).

3. A barrier should be constructed across the exit of the cryogenics penetrations to block that part of the opening outside the pipes themselves (CK-12oclock-3). The intact barrier should achieve a dose reduction to a person at the penetration of about 2. A. Stevens will oversee the design and construction of this barrier.
The subcommittee recommendations which should be implemented as soon as practicable, but need not be in place until after the first year’s run (wherein intensity is limited to half of design) are the following:

4. Additional shield blocks, approximately 5 ft. by 5 ft. by 10 ft. vertically, should be positioned as shown in Fig. 2 of the attachment on the side opposite ring center (CK-12oclock-4). R. Marascia will oversee this addition, which will reduce the maximum exposure at human height by about a factor of 2.

5. If practicable, light beam sensors at human height (or some other proximity detection system) should be installed across the end walls (a 55 ft. span) on both sides at this IR (CK-12oclock-5). This is NOT regarded as a personnel protection device, but as perimeter protection information. The signal would be returned to the control room by the control system, not PASS, and beam abort would NOT be triggered. S. Musolino will investigate the practicability of implementing such a system.

6. A “fence within a fence” should be constructed to further barricade the approach to the cryogenic penetration exits (CK-12oclock-6). The fence should be 10-20 ft. away from the penetration, have a locked gate, and preferably be topped with razor wire.

Attachment: AD/RHIC/RD-121

Distribution:
D. Beavis
W. Mackay
R. Marascia
S. Musolino
K. Reece
A. Stevens

cc: RSC file (w/attachment)
RSC (w/o attachment)