

AKR

Minutes of Meeting: Radiation Safety Committee, sub-committee.

Date: Tuesday 10 September 1996

Present: A. Etkin, A. Javidfar, J. Mills, S. Musolino, K. Reece, A. Stevens.

Subject: PHENIX Counting House shielding design.

The design of the shielding to protect occupants of the PHENIX counting house was presented (by A. Stevens) and discussed.

A. Stevens had analyzed a previous design of shielding (ref. 1) for this area which had been comprised of a single layer of hybrid (43 cm. steel, 109 cm. concrete) blocks and did not show an egress labyrinth. The current design differs from the previous design in that: 1) a second layer of blocks (4.8 ft. thick of light concrete) was added in a manner which eliminates all cracks except where the shielding abuts the existing head walls, 2) a labyrinth (believed to be required to satisfy life safety code in this region) is now part of the design, and 3) additional blocks have been positioned in the area to reduce potential "punch-through" problems.

Stevens' analysis of the current design was presented and is documented (ref. 2). The second layer of blocks represents "overkill" for local transverse faults (evaluated at 4 times design intensity). The largest problems are 1) "punch-through" the end wall from a fault on the DX magnet on the opposite side of the assembly building, and 2) radiation caused by the existence of the labyrinth from magnets nearby the shielding.

The end wall "punch-through" is estimated to be less than 300 mrem. In the region of the labyrinth, the "punch-through" was estimated to be approximately 70 mrem, and the low-energy dose propagating through the labyrinth to be about 210 mrem for a total of 280 mrem.

The sub-committee's chief concern was the necessity for the existence of the labyrinth. This labyrinth is intended to be used for emergency egress only and would require a person using it to descend a stairway, which would not be the case if a very well shielded labyrinth (already existing ~ 50 ft. away) were used for egress.

The sub-committee's recommendations were as follows:

1. Application should be made for a variance to eliminate the labyrinth. If construction begins before resolution of the variance request, the labyrinth can be constructed as presented. If the variance request is then granted, the entrance doorway should be filled with patio blocks (or equivalent as practicable). Steve Musolino will pursue this requested variance.
2. Any cracks where the blocks abut the walls which exceed 3/8" should be filled, presumably with grouting material since this shielding is intended to be "permanent".
3. All walls should be photographed as construction proceeds to document the "as-built" walls.
4. Two small errors in the drawings presented to the sub-committee should be corrected;
 1. Some magnets were mis-labeled, and
 2. The planned addition of 1 ft. to the bottom of the LBL door block should be indicated.

References:

1. Memorandum, A.J. Stevens to Chris Ceresko and J. Mills, 11/14/95, "Evaluation of Counting House Shield Design at 8 O'clock".
2. Memorandum, A.J. Stevens to C. Ceresko, A. Javidfar and J. Mills, 9/17/96, "Evaluation of the Current Counting House Shielding Design at 8 O'clock".

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