



Radiation

Safety

Committee

Minutes of Meeting held 8/25 for E941 in the A3 Beam Line

Present: L. Ahrens, D. Beavis, P. Cirnigliaro, A. Etkin, E. Lessard, W. McGahern, W. McKay, A. Stevens, M. Zarcone

D. Lazarus presented additional raytrace calculations which demonstrated that the 24 GeV/c primary proton beam could not be transported to the A1C1 collimator at the front of the A1 cave. A total of 274 out of 50,000 rays corresponding to 5×10^{10} primary protons were 8.5 inches off axis at the A1C1 collimator and had a angle of 17.5 mrad relative to the A3 beam line. These rays would actually aperture in the beam pipe between the A and A1 caves since the beam pipe is only 6 inch diameter and closely packed with steel. This worst case had A1D2 off.

The committee recommends that the experiment be approved for 12 GeV/c secondary positive beam operations. The committee has requested additional raytrace calculations with the primary beam at the lowest expected energy of the F10 energy interlock (90%).

The side wall shielding to the adjacent A2 cave could have typical levels of 10-20 mrem/hr with secondary beam on the A1C1 collimator. The A2 experimenter does have need to go in this area for servicing chambers.

The following protection has been recommended:

- 1) The A2 beam switch will turn off the A3 beam line to prevent undue exposure for access into the A2 experimenter area. The A2 experiment should communicate access needs to A3 experiment to prevent conflicts. A2 interlock on A3 (CK-941-1: D. Lazarus) 139
- 2) A chipmunk will be placed on the roof over A1C1 and set to trip at 2.5 mrem/hr. (CK-941-2 : D. Lazarus) 140 This will protect against any faults which would allow 1% of the primary beam to the collimator. 10TP at 24 GeV/c incident on A1C1 would be expected to produce 300-900 mrem/hr on the roof. Levels of 10 rem/hr could be possible in the A2 side of the wall if 10TP hit the collimator. Two feet of steel shielding will be added to the A2 side wall.
- 3) A 50 cm thick shield block will be placed at the A1 beam port in the A1 primary cave. (CK-941-3: D. Lazarus) 140
- 4) A chipmunk will be placed in/by the A1 beam line where it exits the A1 primary cave. (CK-941-4: D. Lazarus) 142
- 5) The horizontal jaws will be opened to a width of 3mm and disconnected and RSC LOTO. (CK-941-5: D. Lazarus) 143

For higher energy running (above 12 GeV/c) the following are required, before approval is recommended by a sub-committee:

- 1) Ray trace calculations for the lowest possible extraction energy reviewed. (CK-941-6:D. Beavis) 144
- 2) Extraction energy interlock evaluated and reviewed. (CK-941-7:D. Beavis) 145

The openings in the experimental area do not require local enclosures. The experimental area has a total enclosure. It is swept by HP/watch and the dose in the secondary beam is not as high as the Au beam.

The experimenter will use the A1C1 vertical jaws to adjust the beam intensity lower. The expected maximum secondary beam through the collimator is 2×10^7 protons/spill.

Surveys must be done to check any muon punch through of the beam stop. (CK-941-8: D. Lazarus) 146

Potential fault conditions, which are possible by bending the beam with the spectrometer magnets, must be reviewed. This must include the lowest energy which is possible to transport. If possible interlocks on A1D5-7 would be used to require a min. energy. (CK-941-9: D. Beavis) 147