

Radiation

Safety

Minutes of meeting held 8/18 on E941 in the A3 beam line

Committee

Attendees: D. Beavis, E.T. Lessard, S. Musolino, W. McKay, R. Majka, D Lazarus, A. Pendzick

E941 is an experiment that will use secondary protons in the A3 beam line. The experimental equipment and area is the same for E864.

There are two radiation safety issues that distinguish E941 from E864. The first is to prevent primary protons from being transported out of the A cave to the next cave (A1). The second issue relates to a secondary beam in the A3 cave, which could create radiation conditions that are not possible with the ion beams used in the past.

E941 would like to run 12 GeV/c and 18 GeV/c positive secondaries. D. Lazarus presented a series of raytrace calculations which demonstrated (for 18 GeV/c) that under certain conditions the edge of the primary proton beam can approach the beam pipe aperture in the A Cave end wall, but the angle is substantially different by about 9 mr (see attachment 1). There was discussion on the input parameters especially related to the quadrupole steering potential of A3Q3/4 and the potential changes in the status of A2D1 and A3D2. D. Lazarus will examine this and report to the committee next week.

Dose estimates were calculated for the 10TP proton beam. If the A1C1 collimator were hit it was expected to produce 300 mrem/hr on the cave roof (presently a radiation area) and substantially higher levels in the A2 experimental cave. If the primary beam were to be transported to the A3 beam dump, the muons dose rates behind the dump would be 500 mrem/hr. It would be possible to place chipmunks to detect and terminate any such fault. The committee would consider this after the additional analysis of the beam optics is presented.

Both dipole A3D3 and A3D4 would require redundant devices to limit the current and these would be compared to the extraction energy. A shield block will be placed in front of the A1 beam port in the A1 primary cave and the adjacent area locked. A chipmunk will be considered near the quadrupole.

The potential problems with secondary beams into the A3 experimenter cave will be discussed at the next meeting. Issues to be considered include: the potential deflection of a low rigidity beam by the spectrometer magnets, the possible muon component to the secondary beam, (does the secondary beam require a beam limit) and can the secondary protons on the A1C1 collimator create high dose levels to the cave roof and A2 secondary area.

No final recommendations were made pending the discussion of the next meeting.

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