Wednesday 6 November 1996
K. Reece

Minutes of Meeting: Radiation Safety Committee

Date: Wednesday 6 November 1996

Present: L. Ahrens, D. Beavis, H. Brown, H. Crawford, A. Etkin, W. Glenn, E. Lessard, A. McGeary, W. Meng, D. Phillips, K. Reece, A. Stevens, R. Thern

Subject: E896 in the C5 line with Au beam.

Hugh Brown presented the details of the proposed operating modes for E896 in the C5 beamline using Au beam (attachment #1). This experiment will be using five different beam modes, each requiring a separate RSC Check-Off List;

I. Low intensity set-up with 6 GeV/A beam: In this initial "set-up" mode, there will be *NO* target in place and the 6 GeV/A Au beam will be used to set the collimators (CC1 and CC2) to limit the downstream intensity to 1 x 10^6 per pulse **[CK-C5-E896-01]** (this assumes an Administrative Limit of the "C" intensity of ~ 2 x 10^8 per pulse). The dual NMC's will then be set to limit the final beam intensity to < 1 x 10^4 ions/pulse **[CK-C5-E896-02]**. This intensity limit falls within the guidelines for a Class III area. Therefore, the beam does not have to be fully enclosed.

NOTE: One NMC unit is located immediately upstream of C1D5 and has been shielded from the magnetic field. However, the gain of this NMC can change with magnetic fields and must be documented as a function of C1D5 field (OFF, at set-point, at maximum current) **[CK-C5-E896-03].**

NOTE: C5D11 and C5D12 must be LOTO in "B" polarity **[CK-C5-E896-04]**

IIa & b. Low intensity secondary protons: a) A 6 GeV/A primary beam incident on a fragmentation target located at the "C" primary target station (in the place of CP3 which will be retracted and the drive mechanism LOTO **[CK-C5-E896-05]**), producing protons of 6.87 GeV/c. These secondary protons will then be transported through the C5 beamline to the experiment. b) Then an 8 GeV/A beam on the fragmentation target, producing secondary protons that will then be transported through the C5 beamline to the experiment. At both energies of the primary Au

beam, the target will be in place *at all times beam is available* **[CK-C5-E896-06]** and the beam intensity will be limited to < 1 x 10^4 per pulse in the experimental area. For the 8 GeV/A primary beam, the collimator attenuation must be verified and adjusted if necessary to match the original level **[CK-C5-E896-07]**. A maximum current limit (DMR) will be placed on C5D10 **[CK-C5-E896-08]** to prevent the beam from being directed onto the iron of the downstream elements (C5D11 and C5D12).

NOTE: The power supply for the C5D10 magnet is *NOT* capable of bending the 6 GeV/A Au beam beyond the iron of C5D11 or C5D12.

III. Low intensity Au: The fragmentation target will be removed for the remainder of this run **[CK-C5-E896-09]**. Full energy (10.1 GeV/A) Au beam will be transported through the C5 beamline to the experiment. Due to the increase in primary beam momentum, the collimator attenuation must be verified and adjusted if necessary to match the original level of < 1 x 10^4 ions/pulse **[CK-C5-E896-10]**.

IV. High intensity Au: Using only the full energy (10.1 GeV/A) Au beam, the experimental beam intensity will be increased to 1 x 10^5 ions/pulse. This again requires that the collimator attenuation must be verified and adjusted **[CK-C5-E896-11]** and the NMC's re-set to the higher level **[CK-C5-E896-12]**. With the increased beam intensity, the area classification becomes Class I (lower end of classification). The beam must now be fully enclosed using either permanent beam pipe or full enclosure barriers that have "security wire" attached such that the critical devices (C1D5 and C1D6) are interlocked if the wire series is not complete (i.e. barriers in place and wires complete). The method(s) used to fully enclose the beam must be documented by the liaison engineer on the RSC Check-Off List **[CK-C5-E896-13]**. The Security Group must certify the interlock function of the "security wire" **[CK-C5-E896-14]**. Also, the sweep procedure for the area must include inspection of these barriers and "security wire" **[CK-C5-E896-15]**. These barriers must be properly posted "Radiation Barrier. DO NOT REMOVE ! Contact liaison engineer for approval"**[CK-C5-E896-16]**.

Hugh also reviewed the CASIM estimates of prompt radiation around the beamstop from E877 (note that these are for 1 x 10^7 Au ions/pulse). A maximum of 80 mrem/hour would be expected beam left of the beamstop from a full intensity (1 x 10^7 Au ions/pulse) zero degree beam. Two chipmunks are proposed for the area; one beam left of the beamstop (set to interlock @ 20 mrem/hour, alarm @ 10 mrem/hour) and the other beam right near the electronics hut (set to interlock @ 2.5 mrem/hour and alarm @ 2.0 mrem/hour) **[CK-C5-E896-17]**. D. Beavis suggested that prompt radiation measurements from similar geometry of E866 in the B1

beamline may be used (scaled) to estimate the radiation levels along this beamline. One fault study was proposed; place a thick target in C5D11 or C5D12 and measure the resulting prompt radiation on both sides of the beamstop **[CK-C5-E896-18]**.

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