Tuesday 1 April 1997
K. Reece

Minutes of Meeting: Radiation Safety Committee

Date: March 14,1997

Present: D. Beavis, W. MacKay, L. Ahrens, R. Thern, B. Nefkens, R. Prigl, E. Lessard, A. Stevens, W. Glenn

Subject: E913/E914 in the C6 beamline

These items were not discussed at the meeting:

1) Preventing excursion of 400 with 2 NMC[1]
2) Fault levels outside the area[2] (protected by NMC? or move chipmunk)
3) No fault studies requested[3]

The C6 area has been modified for housing the crystal ball. The beam line and intensity capabilities of the beam line are unchanged from previous operations.

Shielding Changes

A steel shield wall has been added downstream of C6D2. This shield wall has a 30 inch by 30 inch hole with a collimator inside. The collimator is expected to remove substantial portions of the beam and estimates of the potential dose rates have been calculated (distributed note by R. Prigl 3/6/97).

A second shield wall constructed of concrete has been placed immediately before the dry room for the crystal ball. The beam is transported through a 7 inch diameter hole in the wall. The combination of the two shield walls prevent the beam from being steered off the beam stop. The beam stop has also been redesigned. The drawings of the two shield walls and the beam stop need to be documented as per AGS OPM procedures (check-off C6-E913-97-1).

Area changes

The dry room is located inside the experimental area. It is envisioned that most entries into the experimental area will not require access to the dry room and therefore it is requested that the door to the dry room have a reset which will not drop out on entering the experimental area. The committee approved this request. The C6 experimental area reset will require that the dry room is reset. The interlock for the dry room reset installed, tested and approved. (Ck-C6-E913-97-2)

A new upstream area has been create around C6D2. This area will have two gates, one on each side of the beam line. The experiment has requested access and reset capability to this area. One gate will exit into the C6 experimental area and the other gate (south side) exits into an area adjacent to the C8 experimental area. The south gate will have a reset station. Both gates will have microswitches. There will not be an electric strike on these gates. The running experiment will be given two keys, one for the gate locks and one for the reset station. Since this area is common to both C6 and C8 the reset key for the experimental area can not be used for this area. This area will stay reset if the C6 area is entered, however this area must be reset before a reset of the C6 or C8 experimental areas can be achieved. The interlock for the C6D2 area reset installed, tested and approved. (Ck-C6-E913-97-3)

Since the C6D2 area can be reset by the user, the high intensity mode of operation which requires HP reset must be disabled. (Ck-C6-E913-97-4)

The area around C6D2 will drop its reset if the C3 line goes to restricted access. (Ck-C6-E913-97-7)

A new sweep procedure must be written. (Ck-C6-E913-97-5)

The new fence around the area must be documented and inspected by the liaison engineer. (Ck-C6-E913-6)

Normal beam conditions

The experiment has requested to operate only in the low intensity mode. Typically running intensity will be 2*10**6 pions/spill at the experimental target inside the crystal ball. The size of the beam at the focus is 10cm**2. The area is a AGS class IV. The two existing NMCs upstream of the experimental area will be used to limit increases in beam intensity above that allowed for this class IV area. The limit is 5*10**6 p/spill. (Ck-C6-E913-97-7). The beam size downstream of the experimental target is larger. The beam is transported in air, no beam barriers are required.

Potential Intensity Increases

The maximum possible intensity was determined after the meeting.

The maximum transportable beam to the C6 area is estimated to be 2*10**9 particles/spill for 10**13 protons on C' target. The C' target is expected to have 10**13 protons/spill during some of the operating period. The 2*10**9 particles/spill represent a possible maximum intensity excursion of a factor of 400 above the C6 allowed limit. This will be prevent by the two NMC paddles used to prevent intensity increases to the upper limit of class II. 2*10**9 particle/spill is the upper limit of a class II area based on the expected beam size and 1000 spills/hr. Additional hardwired means must be used, such as locking a collimator aperture, if it appears that a intensity higher than this can be achieved. A similar limit was required last year--see minutes of April 11,1996 meeting. The liaison physicist must check that this limit can not be exceed with the maximum allowed beam on the C' target. (CK-C6-E913-97-8)

Fault levels outside the experimental area

The fault levels outside the experimental area have been estimated assuming 2*10**8 particles/sec strike a target downstream of the dry room. The highest potential dose rates in the building are 200 mrem/hr (radiation area) and outside the building 40 mrem/hr (uncontrolled area).

Surveys

Surveys of the levels around the perimeter of the C6 experimental area must be taken documented. These should be scaled to the maximum operating intensity. (CK-C6-E913-97-9)

The beam can be on the C' target while the area around C6D2 is occupied. Surveys of this area must be taken to measure potential neutron leakage from the separator area. (CK-C6-E913-97-10)

Comments form RSC Chair:

Note #1: AGS-OPM-9.1.11 allows the maximum intensity of a secondary beamline to be no greater than a factor of 1×10^2 more than the intensity limit as defined by the dual NMC units. In this case, model calculations predict the expected secondary beam intensity from the present C3 target (and with no additional collimation of the secondary beam) could be a factor of 4×10^2 greater than the dual NMC limit. This is for 1×10^{13} protons/spill on the C3 target. An acceptable solution is to set the dual NMC units as defined and limit the primary beam intensity on the C3 target to $\leq 2.5 \times 10^{12}$ protons/spill on the C3 target. After the secondary beam transport is defined, the actual measurement of the primary to secondary intensity ratio will be done and reviewed by the RSC before increasing the C3 target intensity limit.

Note #2 &3: An interlocking chipmunk is presently adjacent to the C6 experimental area. When the secondary beam has been transported efficiently to the experiment, the Health Physics surveys of the area will be reviewed by the liaison physicist for any fault studies that may be required and possible placement of any additional chipmunks.

cc: RSC
RSC file