Wednesday 15 June 1994
K. Reece

Minutes of Meeting: Radiation Safety Committee Monday 13 June 1994

Present: D.Beavis, H.Brown, G.Bunce, I.H.Chiang, A.Etkin, W.Glenn, E.Lessard, W.MacKay, S.Musolino, D.Phillips, K.Reece, T.Robinson, J.Spinner, A.Stevens, S.Tanaka, D.Trbojevic, K.Woodle.

Subject(s): 1. RHIC transfer line shielding - A.Stevens.
2. C-line intensity - I.H.Chiang.

The first item on the agenda was a presentation to the RSC by A.Stevens concerning methods used to estimate pulsed radiation fields external to the RHIC transfer line. It was requested that the RSC approve the method of calculating pulsed radiation external to the transfer line. These estimates were based on present sidewall and berm cover thickness assumptions and known penetrations.

Two geometries were considered; multi-legged labyrinths (P.Gollon) and single labyrinths with additional "punch_through" estimates (A.Stevens) [viewgraphs in RSC minutes file]. Alan and Peter have discussed the two means of calculating the same geometry (Tesch, Goebel), and the average of the two was usually quoted. Where these two calculations yielded quite different results, the Goebel method was used.

Certain assumptions were made for these calculations;
1. Although the collimator locations have been determined for commissioning, it should be noted that they could be moved or others added at a later time.
2. Loss "source term" was assumed to be local to one magnet (1.8m).
3. Beam intensity used = 1.56×10^{10} Au ions per hour.
4. Berm top annual dose was due to 5% loss at a location.
5. Alan converted P.Gollon's results to Rem/hr.
6. Transfer line ONLY considered, not the arcs or RHIC ring.

The committee had no immediate objection to the method(s) presented by Stevens for estimating the pulsed levels external to the transfer line. It was requested that the committee consider this presentation and meet again in mid-July for final approval (of method).

There were several other associated issues brought up in discussion, (some of which are just noted in "Action Items").
1. Intensity "upgrades" for RHIC (as presently defined) should yield x4 design intensity.
2. Present AGS Au intensity is "self-limiting" to less than that in Alan's estimates.
3. There is an "orphan" section of the upstream U-line for which radiation estimates must be done, including heavy ion faults into g-2 areas while g-2 is under construction.
4. The g-2 construction schedule is necessary to know any restrictions that should be considered.
5. The g-2 (proton) analysis has been done (Lessard) and will be presented to the RSC soon.
6. Fault studies have been discussed (separate group) for the transfer line, but should be submitted for review.

7. Verification of this calculation method may be possible in the AGS SEB area by either reviewing existing labyrinth measurements or conducting a dedicated study.
8. Location(s) of cooling water pipes should be documented.

Action Items (RHIC transfer line):
1. LE verify the transfer line sidewall and berm shielding thicknesses and sign-off shielding map, (D.Phillips).
2. LE verify the transfer line penetrations geometries and sign-off shielding map, (D.Phillips).
3. Transfer line fence must be extended to Thompson Road, (D.Phillips).
4. Additional soil must be added to "X" arc, (D.Phillips).
5. Additional soil must be added over the "arc switch" beam dump, (D.Phillips).
6. For RHIC heavy ion commissioning, a means of prohibiting protons from the AGS must be decided and implemented, (K.Reece).
7. What is the maximum estimate of AGS Au intensity for FY95 ?, (L.Ahrens, K.Reece).
8. Complete radiation estimates for upstream (orphan) U-line shielding and penetrations, (A.Stevens, E.Lessard).
9. g-2 construction schedule, (G.Bunce).
10. Transfer line fault studies must be defined, (W.MacKay, K.Reece).

The second presentation concerned the C-line intensity limit (Chiang). It is now held to 10TP in C-line and is requested to be increased to 15TP, (NOT on C target but in C-line).

I-Hung reviewed previous fault studies in the C target area and although the possible fault levels in the E787 experimental area appear to be acceptable (fault study of "beam switch" indicates chipmunk in the area "sees" the fault), several questions were raised about the adjacent areas;
1. The C3-line intensity is presently limited administratively to 7TP and will not be increased.
2. Radiation levels at cooling tower #2 now require the area around this tower to be controlled as a Radiation Area.
3. Additional radiation measurements should be done, (see Action Items).

It was requested that several measurements be done in the area and the results submitted to the committee before the C-line intensity can be increased.

Action Items (C-line intensity):
1. Measure (in C and C3 running mode) the roof over the C target and Lambertson magnets, (Chiang, Woodle).
2. Measure Quality Factor (QF) at the following locations (HP, Chiang, Woodle);
    1. LESBIII South Primary Gate, measure at floor, beam height and above beam height (@ separator penetration level).
    2. Roof over C target and Lambertson magnets.
    3. Water pipes in the area.
    4. Outside the shield wall at several locations and heights.
    5. At the end of the C3 beam dump.
3. The road adjacent to the C-line should be controlled as a Radiation Are (Njoku).