

Wednesday 29 June 1994

K. Reece

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Minutes of meeting: Radiation Safety Committee, Monday 27 June 1994

Present: L.Ahrens, D.Beavis, H.Brown, G.Bunce, A.Etkin, W.Glenn, P.Ingrassia,  
A.McGeary, A.Pendzick, K.Reece, J.Spinner, W.vanAsselt.

Subject(s): Closeout of North Conjunction Area action items #1 and 2.

In the investigating committee report of the Off-normal Occurrence in the North Conjunction Area, the Radiation Safety Committee was responsible for the close out of two action items by 30 June 1994. The tasks involved in each action item are as follows;

#1: Due 30 June 1994, Radiation Safety Committee.

The Radiation Safety Committee will review and issue formal minutes regarding the adequacy of radiation protection at two other zero degree penetrations, the AGS Switchyard and the Fast Extracted Beam port.

#2: Due 30 June 1994, Radiation Safety Committee.

The Radiation Safety Committee must review and modify OPM 6.1.2 (correction to original text which stated OPM 6.1.7), "Response to Chipmunk Interlocks", to require a health physics survey should interlocks repeat during studies periods, not just normal operations.

#### Action Item #1:

SEB (Switchyard) - D.Beavis: The reference concern for this area was the "muon beam" projected to the "EAG target desk". Possible candidates for the source term for this loss include the F5 and F10 extraction septa, the E20 catcher (internal beam scraper) and the CD1 dipole (first dipole in the upstream SEB line). Pulsed radiation measurements were taken and AGS machine state documented (D.Beavis note of 6/27/94 - RSC file) for the F5 and F10 septa loss conditions. The "EAG target desk muon beam" appears to be correlated with beam loss on either extraction magnet. Proposed shielding additions to the AGS ring at the SEB extraction region (map attached) were accepted and will be installed on Tuesday 28 June 1994 to attenuate the pulsed radiation external to the AGS ring due to this loss mechanism.

The "South Wiring Tunnel chipmunk" will be unaffected by this shielding addition. Also, the berm soil shielding (approximately 20ft.) is already more than the average ring berm shielding thickness over this region.

The present AGS interlock logic already prohibits access to the SEB Switchyard if beam is permitted in the AGS ring (memo McGeary to Beavis 6/27/94 attached).

A verification of the shielding effectiveness should be done in a timely manner as well as a continuation of the probing for source terms in this area.

FEB - G.Bunce/W.Glenn: A review (memo attached) was conducted for this area and the results presented. At the FEB extraction location, there is no zero degree loss point but there is a loss possibility in the H10 - H13 region from which if a beam loss occurred, a small momentum slice could project a "beam" into the FEB tunnel area. Another loss source could be at the H6 location, again projecting a "beam" into the FEB area. In both cases, the FEB tunnel chipmunk (NMO51) will be sensitive to these loss terms.

Using a previous primary beam fault study for the North Conjunction Area with a geometry similar to the FEB area, a comparison was made between the pulsed radiation as measured in the study and that predicted by muon beam calculations of Sullivan (in memo).

It was noted that the upstream FEB beamline elements are scheduled to be installed this November and that they will provide additional shielding by their placement.

There exists another beam port immediately "beam left" of the upstream FEB tunnel. A chipmunk (area monitor for MCR computer display) will be installed at beam height in this tunnel for additional documentation. The possibility of eventually filling this adjacent tunnel with sand was discussed and should be reviewed.

North Conjunction Area - D.Beavis: Possible source terms for this area were noted as the H20 electrostatic septum and in the region of I13 to I18. A proposal for shielding adjacent to the AGS ring was presented. This included using three blocks, each on piers such that the shielding shadows the AGS ring mid-plane (beam height). Locations were as follows;

1. block at I13 - to shield the H20 loss source.
2. one block each at I17 and I19 for the I13 loss term.

There was significant discussion as to whether these blocks should all be set in the mid-plane immediately or to stage them in succession with pulsed radiation measurements done in the area for each configuration. With no unanimous solution reached, the RSC committee finally accepted, by 6 to 1, the original proposal to place all three blocks in the beam mid-plane on Tuesday 28 June 1994. An important point was mentioned, namely that this shielding addition will possibly change the correlation between the chipmunks in the area (NMO49 and NMO77) and the pulsed radiation levels in the Uncontrolled Areas nearby the North Conjunction Area. As a result, before the HEP program may resume after the Tuesday maintenance, two fault studies must be conducted to re-establish the necessary correlation between the chipmunks and control of the adjacent areas.

1. the normal HEP running mode (referred to "chronic" case).
2. an intentional fault in the I13 region.

#### Action Item #2:

OPM 6.1.2 - P.Ingrassia: An RSC sub-committee (E.Lessard, S.Musolino, P.Ingrassia) was charged with re-writing OPM procedure 6.1.2 "Responding to Chipmunk Interlocks" and their version was presented to the full committee. The RSC had four additional suggestions to be considered for inclusion into this procedure;

1. in paragraph 5.9, "IF FOUR interlocks occur in a one hour period, THEN ..."  
[The authors should consider chipmunks that exhibit "chronic" interlocks, those that interlock three times an hour but are below the threshold for action of paragraph 5.9, and how or when to alert an expert (for example a liaison physicist)].

2. paragraph 5.9.5, "If after seven additional interlocks, the cause of the interlocks is not found, THEN ..." [A time period needs to be specified during which seven additional interlocks would trigger the additional procedure steps].

3. The procedure does not deal with interlocking chipmunks that primarily interlock experimenters beam switches.

4. Since the procedure instructs the operators to count the chipmunk interlocks and then initiate some action, it should provide wording to convey that the "operators shall endeavor to accurately count the chipmunk interlocks ..." since the Security PC logs events automatically but the log cannot be filtered according to individual chipmunks.

This procedure will include these suggestions and begin the process of being implemented into the OPM on Thursday 30 June 1994 (tracking, documentation, distribution, training, etc).

cc: RSC distribution.  
RSC file.