

Radiation

Safety

Minutes of meeting held 7/28 on U Line Operations-E938 Revisit

Committee

Attendees: Ahrens, L., Beavis, D., Brown, K., Carroll, A., Etkin, A., Glenn, W., Hastings, J., Kelley, P., Lessard, E., McGeary, A., Musolino, S., Reece, K., Robinson, T., Stevens, A., Tsoupas, N., Zarcone, M.

These minutes include both the discussions from the full RSC as well as the recommendations done by sub-committees afterwards.

The subject of the meeting was the U-line operations for E938. It was noted that other experiments plan to use the beam line during FY99 operations and the usage is increasing.

The major point of discussion was the operations of the U-line with the WXY lines not having an operating PASS system. The U-line was operated last year but the PASS system for WXY was operational. Following last years operations, the U line PASS system was not re-tested at the required six month interval and is non-operational at this time.

A preliminary list of planned beam runs for E938 was discussed (see attachment 1). The acting RSC Chair expressed concern about potential conflicts between RHIC needing to accomplish work in the WXY lines and the AGS trying to service the low intensity experiments in the U-line. The lack of an active PASS system in the WXY lines increases the potential for conflicts. The present RHIC installation schedule has the WXY line PASS system being the last to become operational, probably in Feb. 1999.

The suggested method to prevent access to the WXY lines is to use locks on the gates, while the U-line operates. A meeting will be held in late Aug. after T. Robinson returns from vacation to further discuss the runs in the fall and the coordination of U-line operations with the access needs of RHIC in the WXY lines. It was felt that a scheme with locks on the WXY gates would be acceptable and workable for both the AGS and RHIC.

It was noted that the LSC did not allow the use of locks in the W-line for the sextant test. There was concern that the laboratory management had a policy against the use of locks for protection. The acting RSC chair stated that he thought this specific restriction was specific to beam operations of the W line. E. T. Lessard was requested to clarify this issue with laboratory management (see attachment 2 and 3).

There was strong concern about the egress issues if locks were used. It was deemed important by some of the committee members to have an emergency egress means with locks on the gates. A sub-committee of A. Pendzick, E.T. Lessard, and D. Beavis would examine the detailed issues. The review and approval of J. Levesque was considered acceptable by RHIC. The final scheme was dual locks with keys hung near the gate to open them from the inside. This was found acceptable by the sub-committee and J. Levesque. Notification of the fire department regarding issues of emergency responses to the WXY lines was done.

RHIC requested a fault study be conducted to examine the faults levels in the upstream W-line caused by losses at the upstream portion of the 20 degree bend. This study was previously requested. On the basis of limited data

from a prior fault study, the anticipated fault levels for full beam faults are expected to produce about 10 rem/hr in the W-line enclosure. A new fault study will be conducted with this operation. **(CK-U-1-1998)** In addition, a fault study and surveys will be conducted at gate UGE3. **(CK-U-2-1998)**. Using Tesch, calculation for full beam loss at 24 GeV at 250 feet from the 8 foot-thick concrete wall / labyrinth separating the lines yields 2 rem/h in the W enclosure not counting muon dose. A fault would last only a few seconds when detected by CHIPMUNK interlocking area monitors. Thus, the potential hadron dose is on the order of tens of mrem to any individual who violated the locks and broke in the W line at the same time AGS had a fault in the U line. Muons would not likely go in the direction of the wall / labyrinth with a fault at the 20 degree bend.

The entire WXY berm will be swept, locked and posted as a high radiation area. **(CK-U-3-1998)**. Pending fault studies the upper energy will be limited to less than 4 GeV/c by RSC LOTO of the DC overload trip on UD1-2. **(CK-U-4-1998)**. This further reduces potential fault dose by $(4/24)^{0.8}$ or a factor of 4.

Any transport of materials (foils) by the experiment would be reviewed. **(CK-U-5-1998)**.

The beam switch for the W-line is the 8° bend and the 20° bend. The 8° bend must be turned on, therefore the 20° bend must be held off with 2 different means. Both the DC from the power supply must be RSC LOTO and the AC disconnect must be RSC LOTO. **(CK-U-6-1998)**.

A sub-committee of A. Stevens and A. Carroll would examine (after the meeting) the expected dose levels on the berm and at the new 12 inch diameter pipes for faults of 1.5 GeV beam. The following fault doses were calculated for 10^{15} protons at 1.5 GeV:

- a) 800 mrem on top of the berm
- b) 2.5 mrem at the fence.
- c) 26 mrem at the 12 inch pipe exit with no shielding. The proposed shielding was expected to reduce the levels about a factor of 3-5.
- d) It was noted that scaling with energy could be done with a ratio of energies to the 0.8 power. Thus operations at 24 geV would produce levels about 10 times higher.
- e) It was noted that a fault of 4.8×10^{12} Au ions was expected to produce a fault dose at UGE2 of 8 mrem. Therefore, a fault of 10^{15} protons in an adjacent location would produce a similar level. An interlocking chipmunk exists at this gate.

A sub-committee including D. Beavis and E.T. Lessard recommended that the beam intensity for this short test could be limited by administrative means. The Liaison Physicist (A. Carroll or a designate) must be present and ensure that no more than 10^{15} protons in an hour are transported to the downstream U-line. **(CK-U-7-1998)**. Chipmunks on the berm and in the W-line will limit the fault levels. Approval was given to raise the interlock level to 250 mrem/hr on the chipmunk in the w-line if needed for the test.

(CK-U-1-1998)

(CK-U-2-1998)

(CK-U-3-1998)

(CK-U-4-1998)

(CK-U-5-1998)

(CK-U-6-1998)

(CK-U-7-1998)

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