BROOKHAVEN NATIONAL LABORATORY
RHIC PROJECT
RADIATION SAFETY COMMITTEE
RHIC SUB - COMMITTEE

To: R.K. Reece

From: A. Etkin

Date: June 21, 1995

Subject: Minutes - Meeting June 15, 1995 - Personnel Safety System for U, V, W , X, and Y Lines - Logic - Review

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A meeting of the RHIC subcommittee of the RHIC/AGS Radiation Safety Committee was held on June 15, 1995. D. Beavis, H. Brown, A. Etkin, R. Frankel, R. Heyder, W. MacKay, S. Musolino, M. O'Brien, K. Reece and A. Stevens attended. The committee reviewed the logic of the Personnel Safety System for U, V, W , X, and Y Lines.

The logic for RHIC ATR and g-2 operation has been developed in a state table format with specific PLC modes associated with each operational mode. PLC operating mode can be controlled by the MCR staff or determined by a PLC in response to a change of an input. For RHIC - ATR and g-2 commissioning this coming year, only two redundant PLC pairs will be implemented for the PSS; one in building 921 and one in building 1000P. PLC 921 controls the area from the AGS ring to the W-line shield wall and G-2. PLC 1000P governs the area from the W-line shield wall through the X & Y arcs to RHIC.

The following changes were made to this logic state table;

1] UGS1 gate (U-line separation gate) is not a "controlled" gate and therefore should be removed from the logic.

2] WGS1 gate (W-line shield wall gate) is a controlled gate and must be included in the logic for both PLC 921 and PLC 1000P. This gate will have two sets of door switches and will be monitored by both PLC's.

3] Communication between PLC 921 and PLC 1000P is monitored but no interlock action is taken if lost. However, if communication is lost between either PLC and the respective critical devices, the critical devices are disabled.

4] The Radiation Alarm will only sound when the beam is imminent and not for a chipmunk alarm or interlock. This "Rad Alarm" is only intended to indicate the beam is imminent.

5] Electrical safety inputs are not required for the upcoming commissioning. These four inputs will be bypassed using the present OPM procedures in the "safe " state [device response = disabled]. These bypasses will be done using standard RHIC bypass wires. Testing of the PSS logic will include these electrical safety inputs in this configuration.

6] A re-sweep of the V target area will be required by the PSS PLC system only if the VTGE2 gate is open or not reset. The VTGE1 (blockhouse entrance) gate state will not influence the sweep state of the V target area.

7] In the state tables, reference to LTB beamstops should be Booster beamstops and take the appropriate action to both the LTB and TTB beamstops, (e.g. chipmunk interlock in heavy ion operation would close both the LTB and TTB beamstops; present logic for AGS areas).

8] The Liaison Physicist and the RSC RHIC sub-committee will provide a list of required chipmunks to R. Frankel so other chipmunk inputs can be bypassed.

9] The UGI1 (present U-line stub tunnel) gate will be unnecessary when the H10 ejector magnet is installed this summer since there can be no access allowed to the U-line with beam in the AGS.

10]For PLC 921, mode 16 will be replaced by mode 18.

11]For PLC 1000P, mode 17 will serve the purpose of mode 18 (mode 18 removed).

12]In PLC 1000P, mode 24 is specific to RHIC injection in the Y-line (sextant test). This mode is not required this year and whether it should remain in the PLC code will be decided by this sub-committee.

13]Critical device UD1&2 is controlled redundantly (e.g. both AC and DC disconnect at the power supply).

14]The question of the utility of UD1&2 was discussed. It only permits access to the V1 primary area. Including this device (redundantly) in the PLC PSS is an expense for both equipment

and manpower. On the other hand, if omitted from the PLC PSS, then the g-2 blockhouse gate logic must be completely modified and reviewed. This could lead to restrictive prohibition of access to the V1 primary area whenever beam was in the AGS. Also, administrative access to this area (e.g. LOTO UD1&2 power supply) may well be confusing.

15]Test procedures for this PLC PSS must test ALL combinations of inputs for each PLC for each mode and transitions between modes.

16]At the beginning of the commissioning process for RHIC ATR using heavy ions, access to the W-line downstream (after the W-line shield wall) will be allowed with beam in the AGS. However, at least until the 8 to 20 fault studies are completed and reviewed, **there will be no access allowed to the U, V, W-upstream, W-downstream, X or Y lines** with beam extracted to the U-line.

17]The state tables will be modified (Frankel, Etkin) and distributed to the sub-committee. These changes include many not noted here but indicated on a "master copy" by A. Etkin.

Comment:- For equipment protection only during proton operation, it may be appropriate to tie into and use the Linac Fast Beam Interrupt (FBI) system whenever the Booster F6 septum and BDH2&3 dipoles are interlocked.

xc:, D. R. Beavis, H. N. Brown, R. Frankel, M. A. Harrison, R. Heyder, W. MacKay, S. V. Musolino, M. O'Brien, S. Ozaki, A. Stevens