Sunday 7 July 1996
K. Reece
Minutes of Meeting: Radiation Safety Committee

Date: Thursday 20 June 1996

Present: L. Ahrens, A. Etkin, J. Geller, W. Glenn, E. Lessard, W. MacKay, I. Marneris, A. McGeary, S. Musolino, K. Reece, G. Smith, A. Soukas, R. Thern.

Subject: Co-injection current transformer design.

A proposal for a re-design of the front-end electronics of the co-injection current transformer system was presented to the committee by G. Smith.

In this new proposal, the design of the integrator is such that it "assumes" the beam to be bunched with a time structure of ~ 1us. Given the Booster beam must have a bunched beam of approximately this duration, there is no need for a reset of this integrator, but rather allow it to discharge with a time constant of ~ 100us. This discharge time constant can be more accurately determined and set when the design is final. As with the original proposal (RSC mtg. minutes 28 March 1996), all outputs will be "low = safe".

Full redundancy of this current transformer system remains part of the design. However, the committee recommended an engineering review be conducted on the final design to review possible common mode failure mechanisms.

A self-test (test pulse) of each half of this system occurs asynchronously every ~ 3 - 4 seconds, (one half of the transformer system will always be active). A system reset per half unit will not occur however, if a second reset occurs within ~2 seconds. Another timing check/fault is to declare a system failure (and therefore cause an AGS FEB beam inhibit) if NO test pulse is seen within ~ 4 seconds. As with the integrator time constant, these timing intervals will be more accurately determined for the final design. This system remains, however, synchronized to the AGS main magnet cycle. If a manual reset is requested, the actual reset will not occur until the system "sees" the AGS timing event and will not be latched (possible non-failsafe scenario if latched).

Several issues remain a concern for the committee. The need to be synchronized to the AGS cycle may well be difficult.

1. This assumes there exists an absolute time in the AGS cycle when there will be no beam in the accelerator.

2. Details of the QA of installation and maintenance must be defined.

3. Many Booster cycles (>>1) are not considered an operating scenario for use with this system. It is intended to protect the FEB areas with < 8 Booster batches injected in the AGS.

4. If beam already exists in the AGS, this system will not provide the desired protection. This could occur if the AGS decelerated high intensity beam back to injection energy.

5. The Booster could operate as a beam line and directly extract the injected beam from the Linac. Given the integrator time constant, it will probably not "see" this beam. Placing a current interlock on DH2&3 (I>min) would address this possibility.

6. A method to auto-attenuate the Linac beam should be defined to reduce the nominal Linac beam intensity to the desired level for RHIC use, (e.g. inhibit one LEBT quadrupole pulser).

7. Once the system initiates an AGS FEB inhibit, it will not reset until it receives the next AGS timing event.

8. A sub-committee should investigate as to whether this AGS "no beam" timing event (hardwired) can be made to occur every AGS cycle, (Ahrens, Marneris, Soukas).

9. The level of this single pulse, full AGS intensity fault should be re-documented, (Musolino).

10. The option of providing some barrier/control for Thomson Road should also be reconsidered.

Attachments: 1. RSC mtg. minutes of 28 March 1996
2. Viewgraphs from this meeting, (G. Smith).

cc: RSC (w/attachments)
RSC file (w/attachments)
P. Carolan