

Radiation

Safety

Minutes of RSC Subcommittee of October 24, 2012

Committee

Subject: ERL Low Power Test and RHIC High Intensity Operations

Present: D. Beavis, A. Etkin, R. Karol, N. Kling, D. Phillips, B. van Kuik, I. Ben-Zvi, M. Minty, P. Sullivan, L. Hill, C. Schaefer, S. Belomestnykh, G. McIntyre, J. Reich, C. Montag, E. Lessard, J. Sandberg, and D. Kayran

ERL

The discussion of the ERL exemption request continues from the two meetings in Sept. The schedule has shifted about one month so that the desired low power tests would be in early Jan.

A few items that were discussed¹ at the Sept. 20 meeting and had additional discussion today to ensure that people who were not at that meeting had a chance to offer points of concern.

The committee agreed that once the low power tests start they should be limited to a ninety day duration.

The committee agreed that for a short period of time it would be acceptable to tie the inside chipmunk interlocks to existing chipmunks with interlocks. This has been approved in the past for short periods of time. Each will have their own scalar readout.

The calculations conducted² by Kin Y. for a direct 3.5 MeV beam hit on the concrete roof indicate that the dose rate on the concrete roof would be 0.7 mrem/hr for 7 Watts of beam. The building roof would be 0.02 mrem/hr. The magnets are not capable of bending 3.5 MeV 90 degrees. The maximum energy that can be bent 90 degrees³ is approximately 1 MeV. The potential radiation external to the roof would be a factor of five lower. A hardware limit of 70 Watts coupled with a software limit of 7-10 Watts should provide sufficient protection for the building roof.

Bending the beam down towards the floor can only cause an issue for the laser port. This should be examined. The shadow wall may provide shielding. The geometry and potential fault level will be examined. **(CK-ERL-FY2013-839)**

It was decided not to consider conducting any bending fault studies with the dipole downstream of the five cell cavity. These will be conducted after the ARR has reviewed ERL.

If practicable the valve downstream of the five-cell cavity should be used for fault studies at the gun energy and the accelerated beam energy. This may be a good loss point to examine the 50kW and ODH ports in the shielding. **(CK-ERL-FY2013-840)**

The crane cab does not move. The radiation levels at the cab should be small. However, all elevated work should be avoided during the tests. The posting will signify that restriction until surveys have been conducted to verify that the dose rates are sufficiently low. **(CK-ERL-FY2013-841)**

Access to the ERL roof should have a work plan with the appropriate fall protection. A work plan for obtaining measurements on the roof will be coordinated through Peter C. **(CK-ERL-FY2013-842)**

RHIC

The committee discussed the issues related to operating RHIC with increased beam in each ring and an increase in beam energy to 300 GeV.

The two IRs used by experiments (STAR and PHENIX) have been shown that the original calculations conducted by the RHIC Project using the Monte Carlo code CASIM were conservative. The dose outside the STAR and PHENIX shield wall have been estimated using MCNPX and the potential exposure in a Maximum Credible Incident (MCI) is less than 100 mrem. The same results are expected for the other IRs but have not been calculated. The committee would prefer that these IRs be calculated and at least one fence distance along the beam direction be examined. If the calculations are not completed then a change in the adjacent area posting will be conducted. The posting would be Controlled Area-TLD required. Monitor TLD exist at all the IRs if it becomes necessary to reconstruct dose from an MCI. **(CK-RHIC-FY2013-843)**

The ventilation shafts appear to be at the limit for a controlled area. However, the large survey shafts need to be resolved. There are only a few of these and structure may exist at all of them that can have a barrier attached. **(CK-RHIC-FY2013-844)**

As discussed⁴ in the minutes of August 25, 2009 a work permit will be required for all work on the RHIC berm. Rather than post the entire base of the berm large signs at the road entrances to the RHIC area would be an appropriate means to post the area. Smaller entrances would be posted with smaller signs. It was felt that the work permit system was appropriate as the area has a mature work planning program. The work permit requirements will be integrated into the training and the F&O work order system. This effort will be coordinated by P. Cirnigliaro. **(CK-RHIC-FY2013-845)**

The committee recommended that the calculated of the off-site dose due to muons be completed before the intensity or energy is increased. The committee considers any pathways for off-site exposure as being potentially sensitive. **(CK-RHIC-FY2013-846)**

The top of the roof for building 1004 is being accessed through the berm area during the shutdown. Access to the roof is typically restricted when the beam is operational and also the area of the berm. The access to the berm is controlled via OPM 8.56.ca. It will be examined if the access restrictions can be relaxed for the roof and the berm area adjacent to it.

References

1. http://www.c-ad.bnl.gov/esfd/RSC/Minutes/9_5.20_12_Minutes.pdf
2. http://www.c-ad.bnl.gov/esfd/RSC/Memos/Kin_Radiation_MeV_10_1_12.pdf
3. D. Kayran, "List of Magnets and Beam Instrumentation ", Oct 22, 2012;
http://www.c-ad.bnl.gov/esfd/RSC/Memos/Kayran_ERL_10_22_12.pdf
4. http://www.c-ad.bnl.gov/esfd/RSC/Minutes/8_25_09Minutes.pdf

CC:

RSC minutes file
RSC
Attendees
P. Cirnigliaro
H. Kahnhauser
P. Sampson