

## Radiation

Safety Minutes of RSC Subcommittee of January 29, 2014

## Committee

### **Subject: RF commissioning without shielding at 4 O'clock Magnet Port**

**Present:** D. Beavis, A. Zaltsman, C. Folz, R. Karol (via e-mail), P. Bergh, A. Drees, and P. Cernigliaro

The installation of the 56 MHz cavity requires use of the north magnet port to get materials in and out of the RHIC ring. It has been requested that the RF cavities (storage and acceleration) in the tunnel near the labyrinth (to gate 4GE2) be allowed to be commissioned without shielding at the magnet port.

The dose rates from the cavities can approach 200 rads/hr at a foot based on measurements made by the RHIC Project<sup>1</sup>. The cavities are located in the tunnel near the labyrinth to 1004A. The distance to the north magnet port is about 165 feet. The cavities in the 3 O'clock section of tunnel cannot directly illuminate the north magnet port. The radiation levels caused by conditioning a cavity could be 7 mrads/hr outside the rollup door, using  $1/r^2$  scaling. With multiple cavities being conditioned the radiation levels could be higher by the number of cavities but are expected to be less than 100 mrads/hr.

There are a series of penetrations on the inside and outside walls. No work is planned in the fenced area on the outside of the ring. The small penetrations are about 45 feet away from the cavities and can be directly illuminated by x-rays. The cryo-pipe ports are shadowed by shielding. The area will be secured.

The port at the south end inside the fenced area will be posted as a radiation area. There is no direct illumination of these holes by x-rays from the cavities.

The 9 MHz cavities located near IP4 will not create sufficient x-rays to be an issue for the shielding.

A RSC check-off list will be generated to ensure that the following required items are completed to operate the cavities without shielding at the north magnet port:

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<sup>1</sup> See appendix 24 of the RHIC SAD, 1995

1. RS LOTO which prevents opening the rollup door will be applied by both the LE and the Maintenance Manager.
2. The outside of the rollup door will be posted as a radiation barrier.
3. The area outside the magnet port to the retaining wall shall be roped off and posted as a radiation area. It should also be posted as no access without HP.
4. The area near the rollup door should have periodic radiation surveys conducted during the RF commissioning.
5. The cable ports on the inside of the ring should be roped off and posted as a radiation area with no access without HP during RF commissioning, near the south retaining wall.
6. The fence on the outside of the ring should be swept, secured, and posted as if for normal beam operations. Although the potential dose rates through penetrations are expected to be small, there is no reason to risk any exposure in this area. If there is a need to access with the RF operating then the access will need to be reviewed.
7. The fence on the inside of the ring will be posted Controlled Area TLD required.
8. Before the RS LOTO is removed from the rollup door all RF cavities must be RS LOTOed off using the RF LOTO switch.
9. The 56 MHz cavity will be LOTOed off by one person. The LOTO will remain until the shielding is put in place.