JWG

JWG March 16, 1993

Minutes of the AGS Radiation Safety Committee

Subject: RHIC RF Test Stand.

Meeting Date: February 17, 1993

Present: D Beavis, G Bennett, W Glenn, S Musolino, K Reece, J Spinner, K Woodle, P Yamin, R McKenzie-Wilson, J Rose, J Preisig, J Ryan.

Summary

The RF Test Stand is approved to operate with the 50 kW cavity. Radiation measurements and a reevaluation by this committee will be required for testing the high power cavity.

Meeting Minutes

Steve Musolino presented the analysis of the shielding around the RF Test Stand. The complete details of the analysis and input parameters are in the memo S. Musolino to J. Rose, dated January 26, 1993 (Attachment #1). The analysis used empirical data from a similar system at the NSLS as a basis for the source term.

The Committee did not agree to scale down the source term by a factor of 10 due to the lower anode voltage. Since the power level of the test will be comparable to the NSLS cavity it was concluded that the radiation due to mulitpactoring would also be comparable and not strongly dependent on voltage.

The Committee pointed out that the analysis was based on the peak dose rate of 8 rad/hr at one foot, but the maximum observed absorbed dose in an hour by scaling the area under the peak times 4, was approximately 400 mrad at 1.5 meters or approximately 10 rad in an hour, at one foot. If the dose under the peak was assumed to be due to a spark, and 12 sparks in an hour is used as the maximum credible spark rate, then approximately 30 rad in an hour at one foot is possible.

It should be noted that the area under the peak NSLS dose was approximately 15 minutes, and it is credible to assume that the radiation level is most likely due to multipactoring. Regardless, either assumption of source term makes the enclosure a Class III area. It should also be noted that the source to detector distance has a potential error in it, such that the dose assessment above could vary +/- a factor of two.

This increase in the source term increases the other levels that Musolino calculated but they are still consistent with the proposed controls.

J Preisig presented his modeling of of the expected levels at the access door - 0.5 mrem/hr with the original source term of 0.8 rem/hr. (Attachment #2) Scaling to 10 rem/hr gives an expected value of 6 mrem/hr inside the door. The door of 1/4" of lead on 1" of plywood should reduce these levels by two. Preisig was asked to expand his modeling to include those points that Musolino calculated.

R McKenzie-Wilson gave a description of the door and the interlocks. (Attachment #3) The "Master Relay" is in a lockable enclosure.

The Committee make the following requirements for commissioning and operations:

Enclosures:
The test enclosure is a Class III area and must be swept and reset by Authorized BNL employees. The Committee waived that this be done solely by HP. A Sweep procedure will be needed (CK#1).
The walkway in the highbay will remain uncontrolled and the balance of the building will be posted as a "Controlled Area, Film Badge Required, Radiation Area with RF Power On" (CK#2).

Radiation Monitoring/Studies:
A chipmunk will be placed inside the enclosure to assess the source, with its measured levels continuously recorded (CK#3).
An array of integrating dosimeters shall be placed to confirm the shielding calculations. The badges will be placed in the high bay, the cracks at 90 degrees from the source, the pump room, on the rolling door and in the closest second floor office in the Collider Center (CK#4).
S&EP will conduct surveys during initial operations (CK#5).

Access Control System:
Compose and interlock test procedure for the RHIC OPM, and test every six months (CK#5).
Label all radiation security wiring consistent with standard AGS practice (CK#6).
Label the power supply control relay cabinet with the standard AGS orange tag and provide a lock with a controlled key (CK#7).

Testing of the high power cavity will require another review by this committee.

Outstanding Items:

J Preisig will model levels at other locations.
Another review is required for the high power cavity.

Check List Items:

(RH_CK#1) A Sweep Procedure for area to Operators.
(RH_CK#2) Posting as "Controlled Area, Film Badge Required, Radiation Area with RF Power On" and "Very High Radiation Area" in place.
(RH_CK#3) Recording Chipmunk inside the enclosure to assess the source.
(RH_CK#4) An array of integrating dosimeters shall be placed to confirm calculated levels.
(RH_CK#5) RHIC OPM Interlock test procedure compleated.
(RH_CK#6) Security wiring labled.
(RH_CK#7) Power supply control relay cabinet locked and labled with AGS Orange Tag.

Attachments (file only):
#1 - Musolino to Rose of Jan. 26, '93
#2 - Preisig to Kahnhauser & Musolino of Feb. 4, '93
#3 - R McKenzie-Wilson to RSC of Feb. 8, '93

Distribution: Radiation Safety Committee and guests
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