



Memo

date: Mar. 3, 2008

to: L. Stiegler

from: C. Weilandics *CW.*

subject: 725 RF Equipment Maintenance Re-Survey (2008)

On January 29, 2008, a resurvey of systems XRF1 and as well as the 211MHz VUVRF2 system was conducted by myself in Bldg. 725; in attendance was Tom Seda of the NSLS RF and Power Systems group. The purpose was to resurvey these two systems after maintenance/replacement activities. These systems, together with the other accelerator related RF systems were surveyed back in May of 2007 (re: Weilandics to Ackerman, *Bldg. 725 RF Equipment Survey (2007)*, 10/31/07).

For these measurements, electric (E) field surveys were conducted using a calibrated (Oct. 27, 2007) Narda 8718B Electromagnetic Radiation Survey meter. The E field probe used is capable of measuring RF over the frequency ranges of 300 kHz to 50 GHz. The meter can be set to read out in a variety of units, however for the purpose of this survey it was set to read out in percent of standard. During the survey of the equipment, measurements were taken around the cabinets housing the equipment, specifically at the panel joints where one might expect some leakage. Also surveyed were the accessible portions of the RF cables and their connections, and waveguide joints. In addition to a general survey, for the cabinets, a spatial average was performed where an individual might be expected to stand, both in the front and rear of the racks. This spatial average is typically measured by scanning a planar area equivalent to the area occupied by standing adult human being (projected area). In most cases a simple linear vertical scan of the fields over a 2 m height will be sufficient. In our case, this consisted of an average reading of eight equally spaced points over this 2 meter height, again in front and back of the equipment being surveyed.

Results

For this set of measurements, we found no appreciable (< 1% of the standard) RF from any of the systems.

Discussion

The standard for exposure to non-ionizing radiation which BNL has referenced is the IEEE C95.1-1999 standard also referenced by ACGIH. In all cases the electric field strength levels measured were well below the standard of 1 mW/cm². In referenced standard, induced and contact body current measurements are to be made if the electric field strength levels are above 18% (for the 52.8 and 211 MHz frequencies) of the TLV. In our case this was not exceeded. However, as stated above, these levels do not pose whole body exposures, and in no case was the Threshold Limit Value exceeded. The general TLVs for RF and microwaves

are not expected to change. Based on this preliminary set of measurements, measured magnetic(H) fields are not expected to be significant, or in most cases measurable.

Table I: RF systems measured and conditions of measurement

Number	System Name	Power Rating	Fwd. Pwr.	Rev. Pwr.	Notes
1	XRF1	125 kW	68.4 kW	3.8 kW	~186 mA, 2.8 GeV
2	XRF1	3 kW	2.3 kW	108 W	~186 mA, 2.8 GeV
3	VUVRF2	10 kW	872 W	15 W	184 mA, 800MeV

IH99SR.08

Cc: A. Ackerman
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