

## Memo

*Date:* September 11, 2015  
*To:* RSC, J. Alessi & P. Sullivan  
*From:* D. Beavis   
*Subject:* Deuterium Beam From EBIS

Jim Alessi conducted a beam fault study with deuterons in the EBIS transport. Both routine levels were measured as well as radiation measurements during beam fault conditions and he has written a summary<sup>1</sup> of the study.

During routine operations beam dose rates from intrusive instrumentation such as the pepperpot mask<sup>2</sup> could cause dose rates to become<sup>2</sup> 50 mrem/hr. However, for routine operations an intrusive device would only be inserted for a portion of an hour. It could be that dose in an hour could exceed 5 mrem for brief periods during periods when intrusive devices are being used. Typically personnel are not close to the beam pipe and would probably not receive this level of dose.

The maximum possible beam fault dose rate is 240 mrem/hr. It is unlikely that personnel would receive significant exposure from such an event. There are three chipmunks distributed along the EBIS transport with two<sup>3</sup> being downstream of the Linac.

I request at the next RSC meeting, scheduled for Spet. 16, 2015, that the committee make recommendations regarding the routine operation of deuterium beam from EBIS. I recommend that the committee consider:

1. The area within 5 feet of the beam transport be posted as a Radiation Area for deuteron operation.
2. Place the chipmunks into the monitor system with an appropriate alarm level but do not interlock.
3. Post the entrance of the Booster that there can be elevated levels near the beam pipe due to deuteron injection from EBIS.

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<sup>1</sup> J. Alessi, "Summary of Fault Study 242 with Deuterium Beam from EBIS on July 24, 2015", Sept. 11, 2015; [http://www.c-ad.bnl.gov/esfd/RSC/Memos/7\\_24\\_15\\_EBIS.pdf](http://www.c-ad.bnl.gov/esfd/RSC/Memos/7_24_15_EBIS.pdf)

<sup>2</sup> The full operating intensity and the factor of 6 in weighting factor have been used.

<sup>3</sup> One is near the buncher cavity, one is near the beam stops, and one is on top of the Linac.