

Removal of Soil on the Tandem Roofs while the Tandems Operate

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Soil will be removed from the Tandem roofs to repair leaks. Most of the area will have two feet of soil removed with two feet remaining. An area around the edge of the building will have all the soil removed. The construction work will have a duration of approximately 10 weeks. There are no planned shutdowns of the tandems in the foreseeable future. Therefore, the roof repairs must be conducted while the tandems operate. This sub-committee established the conditions in which the Tandems could operate while the work is done on the roofs.

The committee has assumed the worst-case condition. No soil and a maximum source directly under the area with soil removed. The roof has a minimum of one foot of concrete providing at least a dose reduction of 5. The roof is 20 feet above the beam height providing a source reduction of 400 relative to the strength of the source measured at one foot. It is estimated that the minimum dose reduction is a factor of 2000 relative to a source measured at one foot.

It is desired to keep the work area on the roof as an uncontrolled area. A maximum dose rate of 50 microrem per hour was established. If a worker were at this maximum dose rate for 400 hours a total dose of 20 mrem would be received. This is clearly not expected. In addition the area of the roof with all the soil removed will be for a shorter duration. The standard for dose in an uncontrolled area is satisfied. It is expected that the workers will effectively get zero dose. For example, the accumulated dose detected by radiation monitors in the accelerator room for a 60-day period is typically 400 mrem. This is without the substantial dose reduction to the top surface of the roof. Based on this discussion, the Tandems will operate such that the greatest dose rate at a foot will be 100 mrem/hr. Jim Alessi will prepare a set of operating instructions for the operators to ensure this is the case (see attachment 1).

Measurements have been made to establish which beams can create greater than 100 mrem/hr at one foot. Cl is the heaviest beam that can create more than 100 mrem/hr at 1 foot. Si beams cannot create levels this high due to the decreased brightness of the source.

Any operating conditions, which may require producing level greater than 100 mrem/hr at 1 foot, will be handled on a case-by-case basis. Options include running at night with the area appropriately posted, or conducting surveys to attempt to measure the worst cases.

Surveys will be conducted after initial soil removal to ensure that there are no unexpected radiation levels.

The soil was previously sampled for radioactive materials. None were found. The concern was that contaminated soil could have been placed on the Tandem roof in the distant past. There is no concern that the Tandems could have activated the soil outside the Tandem roof.

Also attached are the restrictions for accessing the HEBT tunnel during the NASA run (attachment 2).

Attachments:

- 1) J. Alessi to C. Carlson, memo April 5, 2002 ; “ Tandem Beam Restrictions During Roof Work : .
- 2) J. Alessi to C. Carlson, memo April 5, 2002, “Tandem Beam Restriction During Access into Linac HEBT Tunnel”

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