Prepared by: D. Raparia
Date: November 27, 2012
Reviewed by: _____ (RSCR)
Date: 11/29/12
Approved by: _____
(C-A Dept. Chair)
Date: 11/29/12

## LINAC RADIATION SECURITY CHECK-OFF LIST

The Linac Tank 1 rf high voltage power supply is to be disabled using the lock-out key switch until the items below are completed. (The RFQ power supply or the ion source extractor power supply may be used as alternatives for high intensity lockout). Record date/time, person responsible for the lockout, and the tag number below.

_____ (Date/Time) _____ (LP)

_____ (Tag #) _____ (Date/Time Tag Removed)

____ (ACG) Functional check of Linac/HEBT interlocks completed.

____ (LP) Beam stops: LEBT BS-1, LEBT BS-2, HEBT NZ304, HEBT NZ225, LTB #1, LTB #2 in place and functioning.

____ (LP) Gates inspected:

a. Tank I gate
b. HEBT plug door/sliding gate
c. AGS-HEBT gate
d. Tank 9 gate
e. TTB gate
f. BLIP tunnel gate
g.REF tunnel

____ (RCD) Signs in place at Gates:

a. Tank I gate
b. HEBT plug door/sliding gate
c. AGS-HEBT gate
d. Tank 9 gate
e. TTB gate
f. BLIP tunnel gate
g.REF tunnel

____ (LP) Chipmunks in place:

a. BLIP Pump House (2)
b. Linac lower equipment bay:
    Tank 4/5 alcove
    Tank 6 low energy transmission line penetration
    Tank 6/7 intertank vacuum penetration
    Tank 8/9 intertank vacuum penetration
    Cable tray downstream of Tank 9
    Tank 1 gate

____ (IG) Functional checkout of chipmunks complete:
a. BLIP Pump House (NM061 & NM065)
b. Linac lower equipment bay:
    Tank 4/5 alcove (NM063)
    Tank 6 low energy transmission line penetration
    Tank 6/7 intertank vacuum penetration
    Tank 8/9 intertank vacuum penetration
    Cable tray downstream of Tank 9 (NM062)
    Tank 1 gate (NM068)

____ (ACG) Following chipmunks tied in to security system, interlocking LEBT BS-1 & BS-2, and tested:
1. BLIP pump house chipmunks (NM061 &NM065)
2. Tank 4/5 alcove chipmunk (NM063)
3. Tank 1 gate (NM068)

____ (WG) Check that the BLIP transport water pump house gate is locked.

____ (RCD) BLIP pump house posted as a High Radiation Area.

____ (RCD) Area around the BLIP pump house posted as a Radiation Area.

____ (WG) Checklist for entry into the BLIP pumphouse posted on the pumphouse entrance.

____ (LP) Check shielding of Linac Lower Equipment Bay.

____ (LP) Check shielding of AGS-Linac interface

____ (LP) Check shielding of TTB-Linac interface.

____ (LP) Check shielding of TTB-Booster interface.

____ (LP) Check shielding of Linac-Booster interface.

____ (LP) Check shielding of BLIP tunnel-REF tunnel interface.

_____(LP) All Linac shielding including the berm found to be satisfactory.

____ (LP) BLIP locked off or BLIP Radiation Security Check-Off List completed.

____ (BP) LTB RS LOTOed off.

____ (LP) HEBT beam stops NZ 304 permanently in the beam, and red-tagged by a LP radiation security red tag.

___ (LP) The Linac has been reviewed for compliance with the Operational Safety Limits as given in OPM 2.5.

____(RSCC) Check-off database item 713 has been addressed.

____( ACG) All active bypasses have been discussed with RSCC.

____(LP) No changes have been made to LtB that could impact radiation dose out of the EBIS penetration.

____(LP) RF check-off list is complete

____ (LP) Linac ready for beam.

____ (OC) List completion verified by on duty operations coordinator.

When the above items are completed, the Linac may be unlocked for operation.

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|---|---|
| ACG | C-A Access Controls Group (J. Reich or designate) |
| BLP | Liaison Physicist for BLIP (L. Mausner or designate) |
| BP | Liaison Physicist for the Booster (C. Cardner or designate) |
| RCD | Radiation Controls Division |
| LP | Liaison Physicist for the Linac (D. Raparia) |
| OC | Operations Coordinator |
| RSCC | Radiation Safety Committee Chairman |
| WG | Water Group |
| IG | Instrumentation Group (Joe Citro or designate) |

**Linac Chipmunks**

| NMON | Location | Security Trip | Dose Limit |
|---|---|---|---|
| 61 | 946 Lin-Bster Beam Stop 1 | 50mR | 10mR |
| 62 | Trench U/S Linac Plug | -- | 20mR |
| 63 | Tank 4/5 Alcove | 20mR | 16mR |
| 65 | 946 Lin-Bster Beam Stop 2 | 50mR | 10mR |
| 68 | Linac Tank 1 | 20mR | 16mR |