

Booster Radiation Safety Check-Off List for  
operation with **Protons from Linac**  
during (or immediately following)  
operation with Ions from EBIS

December 16, 2014

Prepared by: C.J. Gardner

Sign and Date: Chris J. Gardner 12/16/2014

Reviewed by: D.R. Beavis

Sign and Date: Dona Beavis 12/16/14

Approved by: T. Roser T. Roser 12/16/14

Sign and Date: \_\_\_\_\_

Protons from Linac may be injected and accelerated in Booster **only upon completion of this check-off list**. Before proceeding with the numbered check-off items, the LTB Beamstops must be **Inserted, Locked, and Tagged**. If necessary, equivalent devices and/or procedures may be substituted with appropriate LP and RSC approval.

The LTB Beamstop Lock and Tag are as follows:

\_\_\_\_\_ (LPB) LOTO Booster **LTB** Beamstop Enable Key (Bldg. 914):

Tag Number 5317

Lock Number 15L994

Person/Date: Chris Gardner 26 August 2014

The following items are to be initialed as complete:

## 1 LTB Status

1. \_\_\_\_\_ (LPL) No changes have been made to the physical configuration of LTB.

## 2 Booster Operational Status

1. \_\_\_\_\_ (LPB) Radiation Safety Check-Off List for Booster operation with Ions from EBIS in effect.

## 3 Security System

1. \_\_\_\_\_ (ACG) All Booster interlocks have current functional checks.
2. \_\_\_\_\_ (ACG) Any active bypasses have been discussed with the RSCC as allowed with linac proton startup.

## 4 Fencing and Posting

1. \_\_\_\_\_ (RCD) In the AGS ring, the Booster/AGS labyrinth must be posted on top as follows, to prohibit personnel from working on top of the labyrinth:  
**“Caution! Elevated Work Requires Work Planning.  
Contact Liaison Engineer or Work Planning Manager for  
operational status and work planning.”**

## 5 Administrative Items

1. \_\_\_\_\_ (LPB) Memo stating Booster Parameter Limits that are consistent with the Booster Operational Safety Limit in OPM 2.5 has been issued to MCR for required reading.
2. \_\_\_\_\_ (CME) Linac proton beam may be put into the B6 dump at an average rate of no more than \_\_\_\_\_ protons per 4 second repetition period.

## 6 Booster Extraction to AGS

Either Item 1 or Item 2 must be completed:

1. \_\_\_\_\_ (LPA) The AGS is ready to accept proton beam.  
**OR**
2. \_\_\_\_\_ (LPA) Booster Extraction to AGS is LOTO:  
Tag No. \_\_\_\_\_  
Lock No. \_\_\_\_\_  
Person/Date: \_\_\_\_\_

## 7 Booster Extraction to NSRL

Either Item 1 or Item 2 must be completed:

1. \_\_\_\_\_ (LPN) NSRL (R-line) is ready to accept beam.  
**OR**
2. \_\_\_\_\_ (LPN) Booster Extraction to NSRL is LOTO:  
Tag No. \_\_\_\_\_  
Lock No. \_\_\_\_\_  
Person/Date: \_\_\_\_\_

## 8 Verification and Permission

All of the above check-off items have been initialed as complete.

\_\_\_\_\_ (OC)

\_\_\_\_\_ (Date/Time) The RSC LOTO(s) that prevent Linac proton beams from entering the Booster may be removed. The **LTB** beamstop remote enable key (in Bldg. 914) may be inserted and turned (or equivalent devices enabled) to allow beam enable from the MCR.

\_\_\_\_\_ (LPB)

\_\_\_\_\_ (Date/Time)

## 9 Abbreviations

LPL = Liaison Physicist Linac (**Deepak Raparia** or designee)

LPA = Liaison Physicist AGS (**Haixin Huang** or designee)

LPB = Liaison Physicist Booster (**Chris Gardner** or designee)

LPN = Liaison Physicist NSRL (**Adam Rusek** or designee)

CME = Chief Mechanical Engineer, ME (**Joe Tuozzolo** or designee)

RSCC = Radiation Safety Committee Chair (**Dana Beavis** or designee)

ACG = Access Control Group (**Jonathan Reich** or designee)

MCR = Main Control Room

OC = Operations Coordinator