

8.1.1 Linac Systems Turn On for Booster

1. Purpose

To provide instructions for Linac staff on how to turn on the Linac systems in preparation for operation for the Booster.

2. Responsibilities

- 2.1 MCR Operations Coordinators (OC) initiates the turn on of the Linac by request.
- 2.2 Linac staff turn on the subsystems.

3. Prerequisites

- 3.1 Control System must be operational.
- 3.2 Qualified and trained Linac staff.
- 3.3 The Linac Operations Coordinators should be consulted concerning Linac turn on.
- 3.4 All personnel working on any electrical system or equipment in the C-AD shall be familiar with BNL [SBMS Electrical Safety](#), BNL [SBMS Lockout/Tagout \(LO/TO\)](#), [C-A-OPM 1.5, "Electrical Safety Implementation Plan"](#), [C-A-OPM 1.5.3 "Procedure to Open or Close Breakers and Switches and Connecting/Disconnecting Plugs"](#), [C-A-OPM 2.36, "Lockout/Tagout for Control of Hazardous Energy"](#). C-AD will provide on-site/work specific training to individuals in the electrical safety aspects of their job functions and assignments.

4. Precautions

- 4.1 Linac Supervisor, or Operations Coordinator, must have cleared the Linac tunnel for rf, and the Tank 1 and Tank 9 gates must be closed prior to feeding rf into the accelerating cavities.
- 4.2 The Linac tunnel, HEFT, and BLIP must be secured prior to accelerating beam in the Linac.

5. Procedure

Note:

If the Linac has already been turned on for BLIP ([C-A-OPM 8.1.2](#)), then jump immediately to step 5.12.

- 5.1 Check the Building Services panel in the Linac Control Room (LCR, rack F-11) to see that all water services are available. Contact the Water Group if any water system needs to be turned on.

- 5.2 Check the status of the vacuum for the ion source, LEBT (gauges in the preinjector area), tanks, and HEBT (gauges along the lower equipment bay). If any of the pressures are above 2×10^{-6} T, notify the C-A Vacuum Group.
- 5.3 Verify that the following beam stops are closed: Booster (LTB1 or LTBDH1 and LTB2), AGS (NZ304, NZ307), Tank 9 (NZ86), and Source Valve 0-9. The indicator lights for the status of these devices are located in ICR Rack F2.
- 5.4 Initiate the Ion Source Turn On, [C-A-OPM 8.1.5](#).
- 5.5 Initiate the Cavity RF Systems Turn On, [C-A-OPM 8.1.6](#).
- 5.6 Initiate the RFQ Turn On, [C-A-OPM 8.1.7](#).
- 5.7 Initiate the LEBT Transport and Bunchers Turn On, [C-A-OPM 8.1.8](#) and [8.1.9](#).
- 5.8 Initiate the Tank Quadrupole Turn On, [C-A-OPM 8.1.10](#).
- 5.9 Initiate the HEBT Turn On [C-A-OPM 8.2](#).
- 5.10 If the Linac, HEBT, and BLIP tunnels are not yet secured, contact an MCR OC to have the tunnels secured.
- 5.11 The turn on is complete when the following are fulfilled:
 - 5.11.1 The ion source is operating at 35 kV, and beam can be measured at the L1 transformer.
 - 5.11.2 The tank rf, RFQ, LEBT, HEBT, and tank quad systems are all on with no system malfunctions indicated in the LCR.
 - 5.11.3 Satisfactory vacuum has been attained in all sections. (If a section other than the ion source has a pressure greater than 2×10^{-6} T, the C-A Vacuum Group should investigate and give approval before operation).
 - 5.11.4 Linac, HEBT, and BLIP tunnels are secured.
- 5.12 If the Linac has already been turned on for BLIP, only the following has to be done for AGS Turn on:
 - 5.12.1 Check the status of the HEBT vacuum (gauges in the lower equipment bay). If any pressure is above 2×10^{-6} T, notify the C-A Vacuum Group.
 - 5.12.2 Turn on the HEBT BM4 power supply by doing steps 9-17 in the HEBT Turn on [C-A-OPM 8.2](#).

6. Documentation

- 6.1 Completion of Linac turn on will be entered in the MCR OC log and Linac Operations logbook.

7. References

- 7.1 [C-A-OPM 8.1.2, "Linac System Turn On for BLIP"](#).
- 7.2 [C-A-OPM 8.1.5, "Ion Source Turn On"](#).
- 7.3 [C-A-OPM 8.1.6, "Cavity RF Systems Turn On"](#).
- 7.4 [C-A-OPM 8.1.7, "Turn On of RFQ 1"](#).
- 7.5 [C-A-OPM 8.1.8, "LEBT Bunchers Turn On"](#).
- 7.6 [C-A-OPM 8.1.9, "LEBT Transport Devices Turn On"](#).
- 7.7 [C-A-OPM 8.1.10, "Tank Quadrupole Turn On"](#).
- 7.8 [C-A-OPM 8.2, HEBT Turn On"](#).
- 7.9 [C-A-OPM 1.5, "Electrical Safety Implementation Plan"](#).
- 7.10 [C-A-OPM 1.5.3 "Procedure to Open or Close Breakers and Switches and Connecting/Disconnecting Plugs"](#).
- 7.11 [C-A-OPM 2.36, "Lockout/Tagout for Control of Hazardous Energy"](#).
- 7.12 [SBMS Electrical Safety](#).
- 7.13 [SBMS Lockout/Tagout \(LOTO\)](#).

8. Attachments

None