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C-A OPERATIONS PROCEDURES MANUAL

8.2 HEBT Turn On

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Hand Processed Changes

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Approved: _____ *Signature on File* _____
Collider-Accelerator Department Chairman Date

J. Alessi

8.2 HEBT Turn On

1. Purpose

To provide instructions for Linac staff on how to turn on HEBT quadrupoles, steering dipoles, and BM4/5.

2. Responsibilities

2.1 Linac staff can turn on HEBT.

3. Prerequisites

3.1 All personnel involved in working on any electrical system or equipment in the C-A 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-A will provide on-site/work specific training to individuals in the electrical safety aspects of their job functions and assignments.

3.2 The DACAD controls, PDP-8E, and the PDP-10 should be operational.

3.3 Transport water should be on.

3.4 The Linac Operations Coordinator should be informed of this turn on.

3.5 Qualified and trained Linac staff.

4. Precautions

4.1 If the HEBT tunnel is open, inform people in the tunnel before powering the beamline elements and warn of electrical and magnetic field hazards.

5. Procedure

Turn on of HEBT Quads & Steerers

5.1. Check that the main 460 VAC disconnect switch is on - switch 8, ckt 11, on HEBT SE wall opposite plug door.

5.2. Check that the main breaker for the Mod 9 rack is on (at the upstream end of the rack, labeled "For Quad PS Only").

5.3. Check that the main breaker for the HEBT rack is on (inside the front door on rack closest to the BM2 PS).

- 5.4. Check that the ± 15 V supply for the HEBT control bucket is on (rack A6A4).
- 5.5. Check the HEBT malfunction lights in rack A6A4. All lights should be blinking, indicating that all malfunction circuits are working.
- 5.6. The HEBT quad turn on button is in rack A12. If the switch does not indicate a malfunction, clear the "Local Lock" and turn on the supplies. If a "Remote Lock" is indicated, then this must be cleared by the "HEBT QUADS" switch in the Linac control room, rack F7. If a malfunction is indicated, check that the BLIP water is on and that the transport water is on (indicators in rack A12).
- 5.7. Check to make sure that the DACAD settings for all HEBT quadrupoles and steerers are at the last saved values (AGAST file "MOD9").
- 5.8. In about 2-5 minutes after turn on of the supplies, all malfunction lights should be out. If a light remains on, check the corresponding supply. If a supply is bad, turn off all supplies and follow the spare replacement procedure or call a system expert.

Turn on of HEBT BM4/5

- 5.9. Check that the main 460 VAC disconnect switches are on
 - a. Switch 8, Ckt BM-4, on the HEBT SE wall, opposite the plug door.
 - b. Switch 8, Ckt BM-5, same location
 - c. Switch 8, Ckt 7, same location
- 5.10. Check that the main breaker for the HEBT rack is on (same as step 3 above).
- 5.11. Check that breaker A31-A38 is on (HEBT SE wall, opposite plug door).
- 5.12. Check that all doors are secured on both supplies (located by the plug door).
- 5.13. Check that the control breakers are on for both supplies.
- 5.14. If the ready light is not now on, press the reset button. If the ready light still doesn't come on, a malfunction light should tell you what is wrong. Once the problem is fixed, press the reset. When the ready light is on, the supply is ready to turn on.
- 5.15. The turn on switch is located in rack A38 by the supplies. Clear the "Local Lock", and turn on the supplies. If there is a "Remote Lock", then this must be cleared by the "BM4&5" switch in the Linac Control Room, rack F7.
- 5.16. Check to make sure that the DACAD settings for BM4&5 are at the last saved values (AGAST file "MOD9").

5.17. In about 2-5 minutes after turn on of the supplies, all malfunction lights should be out. If a light remains on, check the corresponding supply. If a supply is bad, turn off both supplies and troubleshoot, or call a system expert.

6. Documentation

None

7. References

- 7.1 [C-A-OPM 1.5, “Electrical Safety Implementation Plan”](#).
- 7.2 [C-A-OPM 1.5.3 “Procedure to Open or Close Breakers and Switches and Connecting/Disconnecting Plugs”](#).
- 7.3 [C-A-OPM 2.36, “Lockout/Tagout for Control of Hazardous Energy”](#).
- 7.4 [SBMS Electrical Safety](#).
- 7.5 [SBMS Lockout/Tagout \(LOTO\)](#).

8. Attachments

None