If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match.
The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.
Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A.

C-A OPERATIONS PROCEDURES MANUAL

8.1.9 LEBT Transport Devices Turn On for Proton Operation

Text Pages 2 through 5

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

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

B. Briscoe, V. LoDestro

8.1.9 LEBT Transport Device Turn On for Proton Operation

1. Purpose

To provide instructions for Linac staff on how to turn on quads and magnets in the Low Energy Beam Transport system.

2. Responsibilities

Linac staff are responsible for turning on the LEBT Devices.

3. Prerequisites

3.1 All personnel involved in working on any electrical system or equipment in the C-A shall be familiar with BNL ES&H Standards 1.5.0, 1.5.1 and 1.5.2. C-A will provide on-site/work specific training to individuals in the electrical safety aspects of their job functions and assignments.

3.2 Transport water system is on.

3.3 Chilled or City water is cooling the LEBT Solenoid Pulsers.

3.4 The Linac Operations Coordinator shall be consulted prior to turn on.

3.5 Qualified and trained Linac staff.

3.6 Solenoid and Triplet shields are in place.

3.7 All power terminal covers are in place.

4. Precautions

None

5. Procedure

5.1 Check that the main 480VAC disconnect switch for Quad P.S. is on. This provides power for the LEBT Pulsed Quads.

5.2 Check that the main breakers for each ACME power supply are on.

5.3 Check to see if all malfunction lights are blinking.

5.4 Directly notify all persons working in the affected area. Announce on PA channel 16 that the LEBT Quads will be energized.

5.5 If no malfunction indication appears on the Quadrupole DC P.S. Control chassis, a green off indication will appear; remove any local lock condition by depressing the off control. If a Remote Lock condition exists, clearance to operate must come from the Linac Control Room. If a malfunction is indicated, check transport water flow.

5.6 Run Spreadsheet and check the Preinjector file for the last saved settings in all modes. If necessary, reset all valves.

5.7 Turn on LEBT Quads, the system will go into a “Process” state. Within two to five minutes all malfunction lights should go out; a red ON indication will appear, the system is now ready to run.

5.8 If all malfunction lights do not go out, check the Pulser that corresponds to the malfunction indication for correct setting and stop-charge monitor.

5.9 If Pulser is bad, turn off all Quads and follow the posted procedure, "Installation Of Spare Pulser."

5.10 After replacement of Pulser return to instruction 5.3.

5.11 Check that the main 208 VAC breakers are on for the LEBT Steerers, located in panel A2 on the north wall in Pit I:

- panel A2 ckt. #5 for the High Energy Steerers.
- panel A2 ckt, #7 for the Low Energy Steerers.

5.12 Check that all breakers are on all Kepco supplies.

5.13 Directly notify all persons working in the affected area, announce the LEBT steering dipoles will be energized.

5.14 If no malfunction indication appears on the LEBT Steering turn on switch controls, located in rack #3, green off indications will appear; remove any local lock condition by depressing the off control. If a Remote Lock condition exists, clearance to operate must come through the spreadsheet preinjector control page.

5.15 Run Spreadsheet and check the Preinjector file for the last saved settings in all modes. If necessary, reset all valves.

5.16 Turn on the High and Low Energy Steerers. Within two to five minutes all malfunction lights should go out; the system is now ready to run.

5.17 If all malfunction lights do not go out, check the Steerer PS corresponds to the Nim Led malfunction indication.

5.18 If a Kepco PS has failed, turn off all Steerers and replace with spare power supply.

5.19 After replacement of PS, return to instruction 5.12.

5.20 Check that the main 208 VAC breakers are on for the LEBT Solenoid Magnets, located in panel A2 on the north wall in Pit I:

- panel A2 ckt. #'s 8, 10, 12 for Solenoid 1.
- panel A2 ckt, #'s 14, 16, 18 for Solenoid 2.

5.21 Directly notify all persons working in the affected area, announce that the LEBT Solenoid Magnets will be energized.

5.22 Turn on the front panel AC switches for solenoids 1 & 2 Power Block Pulser Chassis. Place corresponding Cap Bank Operate/Discharge switches into the operate mode.

5.23 The power Block air flow light must go out for both solenoid magnets.

5.24 Turn on the 60VDC power supplies for both solenoid pulsers, the supply currents should be pulsing. Observe that both 60VDC power supply malfunction lights are out.

5.25 The solenoids high temperature and water flow lights should also be out. If not, check transport water.

5.26 If no malfunction indications appear on either Solenoid Magnet turn on switch controls, located in rack #5, green off indications will appear; remove any local lock condition by depressing the off control and turn on the Solenoids. If a Remote Lock condition exists, clearance to operate must come through the spreadsheet Preinjector control page.

5.27 Run Spreadsheet and check the Preinjector file for the last saved settings in all modes. If necessary, reset all valves.

5.28 Each TCR main pulser power supply for Solenoids 1 & 2, located at the bottom of racks #4 & 5, should come up to 45-55VDC and start pulsing.

5.29 Displayed on the monitor scope in rack #2 should be two wave forms. These are the current pulses for solenoids 1&2. Total width for each pulse is 30 msec, with a 2 msec flattop. Nominal operating values viewed at 200amps/volt are:

- solenoid 1 ---------- 400 A
- solenoid 2 ---------- 400 A

5.30 Within two to five minutes all malfunction lights should go out the system is now ready to run.

5.31 If all malfunction lights do not go out, check the Solenoid Magnet Interlock panel. If pulser has failed, turn that pulser off and repair or replace with spare.

5.32 After replacement of pulser, return to instruction 5.22.

6. Documentation

None

7. References

None

8. Attachments

None