

## Overview

This guideline defines when Lockout/Tagout (LOTO) is required for high voltage diagnostics.

## Background

1. Many diagnostics at LLE require high voltage (HV, >50V) power supplies (PS) for their operation
2. Connected devices (e.g., cables and detectors) can store a charge if disconnected from the HV source while the supply is enabled
3. Diagnostics requiring HV supplies are often located in places that are difficult to access, such as near the target chamber (head-bump hazard) and on elevated structures (fall hazard).
4. LLE policies and procedures seek to mitigate the risk of:
  - a. Electrical shocks
  - b. Secondary injuries that could result if a worker were shocked (e.g., fall, head bump, etc.)

## Safety practices

1. HV power supplies shall be output-limited (current and voltage) in all applications that permit doing so. Limits shall be as follows (based on Stanford Research PS300 product series):
  - a.  $\leq 5$  kV, 5mA max
  - b.  $> 5$  kV -  $\leq 10$  kV, 1mA max
  - c.  $> 10$  kV –  $\leq 20$  kV, 0.5 mA max
2. Any power supply capable of exceeding the above limits shall not be considered output-limited, and must be LOTO before connecting or disconnecting electrical output connections.
3. Procedures shall dictate that **ONLY** HV-approved connectors (e.g. SHV) powered by a current-limited power supply may be connected or disconnected without verifying the state of the power supply output. In all other situations, the power supply must be Locked out/Tagged (LOTO) out per LLE Instruction 6300.
4. HV connections shall use HV-approved connectors when practical (e.g., SHV coaxial connector). Contact the Electrical Safety Officer for connector recommendations or approval.