UNIVERSITY OF KANSAS -LAWRENCE CAMPUS LABORATORY SAFETY MANUAL PART V - LASER SAFETY PLAN

Appendix 8.9 - Selected Design Criteria for Constructing Lasers

Ancillary apparatus for lasers shall be designed and constructed in accordance with applicable safety requirements.

1) A fail-safe control system maintains the desired protective function when the system's final control element returns to the safe position upon activation of its initial control device and upon failure of its power source.

2) Fail-safe control systems shall have been successfully analyzed using the Single Failure Criterion of IEEE Standard 379 before completion of the design.

3) Energy barriers, where required in the Laser Safe Operating Procedures (LSOP) and where readily removable, shall have their positions monitored by initial control devices, such as limit, photocell, or proximity switches, which shall be considered part of the personnel-safety interlock system for the laser.

4) Personnel, equipment, and service access-door positions shall be monitored where required in the LSOP by initial control devices having hardwired final control elements arranged to de-energize the power supply for the laser upon unauthorized access attempts.

5) Where transmission-line enclosures are used, plug and receptacle or pin and socket connectors having one end shorted should be run parallel to transmission-line enclosures and across breaks to ensure continuous enclosure while the beam is operating.

6) Remote control of Class 3b or Class 4 beam operation shall be delegated by sequentially keyed local remote-control stations. The sequential keying shall be considered part of the personnel-safety interlock system for the Laser.

7) Visual indicator used in Laser activation warning systems and annunciators shall have self-checking features, such as push-to-test lights, included in the system design.

8) Laser control elements and devices and emission delay periods shall be listed in the LSOP, Part III, together with any exceptions to the applicable safety-related design criteria accepted by the EHS-Laser Safety Officer.

9) Where single-point grounding systems are used with Laser power supplies, systems, or structures, (troublesome areas), their design criteria shall be documented and approved by Campus Operations. Covered copper braid or flat copper bar shall be considered for use as grounding conductors in circuits having fast rise-times.