Laser Safety Protocol # 006

TO: Laser users

FROM: Laser Safety Program

SUBJECT: **Remote Interlock Connector**
VERSION Date: May 2008

Goal

Specification of the LBNL standard protocol for the requirement of remote interlock connectors.

Protocol

The Laser Safety Program will encourage, but not require, the installation of a remote interlock connector on laser systems (power supplies). The ANSI standard only calls for its availability; it does not mandate its use. For the reduction of laser output as part of an access interlock, the use of external shutters is an equivalent approach to dropping power to the laser power supply.

ANSI Z136.1 / CDRH Specification

The ANSI Z136.1 standard for the safe use of lasers is the Laser Safety Program's general guidance document.

The Center for Devices and Radiological Health (CDRH) is the Food and Drug Administration body tasked with developing laser-light-product perfor-mance safety standards for lasers sold in the United States.

Laser use at LBNL is also guided by LBNL PUB-3000, Chapter 16 (Lasers).

ANSI Z136.1-2000, Section 4.3.7, states: "A Class 3B laser or laser system should and Class 4 laser or laser systems shall be provided with a remote interlock connector. The interlock connector facilitates electrical connections to an emergency master disconnecter interlock, or to a room entryway, floor, or area interlock, as may be required for a Class 4 controlled area."

The CDRH requires a remote interlock connector on a certified laser or laser products for the connection of remote interlocks or controls to the laser system; the CDRH does not require its use, only its availability.

Rationale

When deciding on the applicability of ANSI controls, the LBNL LSO considers its safety implications and engineering feasibility.

The majority of Class-3B and Class-4 lasers used at LBNL are commercially made units that have a remote interlock connector and are therefore in compliance with this ANSI Z136.1 control.

It is when the laser system is custom-made or assembled from a kit that the

presence or lack of a remote interlock connector is possible. The CDRH allows the use of “uncertified” laser products if the users are also the builders of the units and, in particular, if they are one of a kind. “Uncertified” means that the user of the laser product does not have to submit a compliance document to CDRH, and/or the laser product does not have to comply with all CDRH requirements; for example, an R&D laser system could be a fiber system, dye laser, or diode laser, which may or may not have a power supply with a built-in remote connector.

The purpose of the remote interlock connector is to facilitate the utilization of an access system that would cut power to the laser if the access control is violated. When entryway access control is required, two equivalent solutions to block or reduce laser emissions may be used: (1) an interlock system connected to the power supply through the remote interlock connector, or (2) a shutter-based system, either internal or external to the system.

The main drawback of the remote interlock connector is that loss of power to laser systems affects the thermal stability of the laser system to the extent that hours may be needed to regain a stable thermal condition. This situation can be avoided by a laser shutter that is external to the laser and triggered by an interlock, and which does not go through the remote interlock circuitry built into the laser. Tripping the laser interlock closes the shutter and provides protection from laser radiation without significantly affecting the thermal stability of the laser system.

Contact Information

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