THE UNIVERSITY OF CHICAGO | Office of Research Safety

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Researcher Injury during Ti:Sapphire Alignment

What happened?

Two researchers were performing an alignment of a 15W Ti:Sapphire laser. Researcher One adjusted a beam isolator and exposed their finger to a 45-degree deflection beam (800 mW) from the main beam line. Researcher Two discovered the beam deflection with an alignment card and the deflection was corrected with the laser put in a safe operating mode.

What was the cause?

The laser was at full operating power during the alignment which increased the potential for injury with a misalignment. The beam isolator was not performing as expected and a stray beam irradiated the finger of the researcher as they were rotating the isolator per the manufacturer's instructions.

The operator's manual provided by the manufacturer does not adequately address the potential hazards of stray beams.

What were some of the things done well?

The laboratory is commended for having two individuals working on the alignment. Without the second researcher's presence the deflected beam would not have been discovered as quickly and greater injury may have occurred. The researchers immediately put the laser in a safe operating mode and confirmed no additional stray beams. The researchers were current with their laser safety training and were wearing appropriate laser eyewear. In addition, upon discovery of the injury, the researcher went to student health to receive first aid. The laboratory PI submitted a UCAIR report the following day after the incident.

What are some lesson learned?

Laser alignments should always occur at the lowest power possible, either by decreasing the output power, attenuating the beam, or using an alignment laser. In addition, whenever instrumentation or equipment is not operating in the manner in which the manufacturer has specified, users should pause work and determine the issue with the instrument/equipment especially with higher hazard/non-routine work.

Furthermore, ORS will expand the laser safety training to include pausing and evaluating the situation when experiencing anomalies or unexpected results.