Introduction to specifying and mitigating laser damage

In today’s environment of shrinking systems and a focus on making lasers affordable, the oldest problem in building reliable lasers - laser induced optical damage - is at the forefront of every laser designer’s mind. From specifying and verifying the laser damage threshold of specialty coatings, to imparting appropriate cleaning procedures on the production line, no aspect of the design and build process can be neglected in order to achieve success reliably. This course will provide an overview of the history of laser damage, the scientific community’s understanding of critical mechanisms at play, a review of the current standards of use, and good practices for testing and mitigating laser damage mechanisms. Completion of the course will bring a broad understanding of laser damage, and provide a strong base on which to build solutions for a variety of laser damage problems.

LEARNING OUTCOMES
- Familiarization with laser damage specification standards
- Understand common mechanisms in laser induced damage
- Learn practical and specialty implementations of laser damage mitigation techniques
- Specify laser damage thresholds on optical component drawings
- Implement methods to verify laser damage thresholds
- Identify bulk and surface damage differences
- Understand the tools necessary to assess and correct laser damage

INTENDED AUDIENCE
Intended for engineers (laser, systems, optical, and quality), scientists, technicians, and managers who are developing, specifying, or purchasing laser systems.

COURSE LEVEL
Introductory

COURSE LENGTH
Half-day (3.5 hours); .35 CEU

INSTRUCTOR
Jon McGuire has designed, built and tested laser systems for applications in military, space, and biomedical with high quality and reliability demands. Throughout his career he has worked with teams of laser, reliability, quality, and systems engineers to identify laser damage potential before it occurs, and to identify and eliminate laser damage related failures after they occur. He has experience in development and high rate production of laser diodes, fiber lasers, Q-switched lasers and multi-stage non-linear optical components and has witnessed, induced, and mitigated laser damage in a variety of environments. He received a BSE in Optical Engineering from the Department of Applied Science at the University of California at Davis, and an MS in Optics from CREOL at the University of Central Florida. Jon joined the Optics and Electro-Optics Stands Council (OEOSC) in 2007 to develop and implement practical standards for the specification and inspection of optical surface appearance imperfections, and is currently a member of ASC OP/TF7, Laser damage standards.