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Laser Lessons News Letter

This issue

Special Workshop Edition

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Introduction

After taking a year off, we were back strong with another outstanding event. The 11th Department of Energy (DOE) Laser Safety Officer (LSO) Workshop was held at Fermi National Accelerator Laboratory September 27-29. This Special Edition is devoted to recapping the activities of that event.

11th DOE LSO Workshop

Like all previous workshops, planning starts almost a year in advance. This workshop was no exception. A Technical Planning Committee was formed in late fall of 2015. With Matt Quinn (Chairman) taking the majority of the load, he was able to get the workshop announcement put together and out very early in 2016. The shape of Wilson Hall perfectly accommodated the "11"th year logo.

Along with the technical committee, a local organizing committee was formed to handle all the logistics of putting on such a polished and professional workshop. This group should be commended; the entire workshop went off without a single hiccup.

ANSI Z136 SSC9 and TSC4 meetings were held the day before, along with a CLSO Examination which was proctored by Barbara O'Kane. Nine people sat for the exam!

The workshop started Tuesday morning with registration and welcoming remarks by FermiLab management. Providing insight into the great work of the host facility, Chris Stoughton discussed The *Holographic Universe* and Alex Drlica-Wagner presented *Searching for Dark Matter*.

After a quick coffee break it was right into practical laser safety. The session was titled "Implementation and Applications I" and it was true to its word. Chip Edstrom discussed implementing laser safety at FermiLab's FAST Facility, Mike Woods presented *Examples of Controls in Laser Applications at SLAC* and Phillip Evans shared the *Challenges of Laser Safety in Multi-program Active Laser Laboratories.* Having attended all but one workshop, being a part of four planning committees, and having hosted a workshop, I have to say that the bar keeps being set higher and higher.

The next session, "Lessons Learned and Accidents," was very informative with Deana Luke and Arie Amitzi each sharing lessons learned from recent eye injuries at their facilities. Barbara O'Kane finished the session off with a very lively and motivating talk on the *Importance of CLSO Certification*.

The final session of the day was "Implementation and Applications II." Presentations of laser safety programs at the University

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of Texas at Austin, the Orion Laser Facility, and the University of Illinois Urbana Champaign were given by Robert "DeWayne" Holcomb, Graham White, and Anja Metz respectively. These are the types of "practical" laser safety talks that continue to draw in audiences.

The evening brought the vendor-sponsored social event and dinner at Two Brothers Roundhouse. A big thank you goes out to all our vendors who make the social event possible. It was a great time to relax and visit with colleagues and friends.

Day two brought some very interesting talks. The morning session started with Matt Quinn giving us a recap of activities the week prior with *DOE Accelerator Safety Workshop Review*. Tekla Staley from Idaho National Laboratory talked about LOTO, and Thomas Whittenhall from Northwestern University presented *Meeting the Challenges of Safety Training for Diverse Audiences Using Varied Laser Systems*.

For me, the next two session were some of the most interesting and informative. Session 6 "Measurements, Calculations and Eyewear Selection" was phenomenal. Josh Hadler gave one of the most interesting and eye opening talks of the workshop on *Ultrafast Pulse Laser Safety and Eyewear Specification Evaluation at NIST*. Josh explained the importance of knowing the centerline wavelength at Full Width at Half Maximum (FWHM) and the bandwidth when purchasing short pulse laser protective eyewear. Josh intends to publish his findings in the Journal of Laser Applications. Looking forward to reading more on this.

Jamie Santucci gave an equally interesting talk on *Reflective Eyewear Advantages and Pitfalls.* As with Josh's talk with short pulses and eyewear pitfalls, Jamie explained the pitfalls of the reflectivity of eyewear.

Wes Marshall finished off the session with *Maximum Permissible Exposure Limits for Extended Sources.* Bookmark this presentation, because if you are not already working with extended sources, you most likely will be in the future.

Next up was our group photo. Thank you to the photographer who took the picture. This was one of the quickest I have ever been a part of and it came out great. After a nice lunch in the cafeteria, which was right outside of the auditorium, it was back for one last session before the Vendor Exhibition and Laboratory Tours. We chose this year to do a tutorial session because there are so many new faces in the Laser Safety Community. It turns out to have been a very good decision. Matthew Dabney from NREL gave a very engaging tutorial *Optics 101*. I believe that after this a tutorial session may become a staple of future workshops.

The rest of the day was reserved for laboratory tours and visiting with the vendors. A big thank you goes out to all of the tour docents who spent considerable time explaining their work to attendees.

The vendors stayed until everyone was able to meet with them and discuss their individual needs. I saw many a business card being passed around.

The evening was the 3rd Annual LSO Appreciation Event at Mike & Denise's Pizzeria thanks to Laservision. It was nice to eat some deep dish pizza and enjoy the company of friends that we don't get to see too often.

The last day was no less interesting than any of the others. The first session "High Power and Large Facility Operations" was worth the wait. The first speaker Geoff Cushman from NASA-Ames gave a talk on the *NASA Ames LEAF Lite: Using 50-kW Lasers to Test Radiative Heating Component of the Orion Heat Shield*. I think Geoff won the award for the best show-and-tell item in a piece of metal that had been burned through with the laser. Did I mention that they plan to use 200 kW's worth of lasers to do their testing?

Randy Paura, one of my fellow proponents for a Class 5 laser, gave a talk on *Risk Assessments for High Power Lasers.* Not to be outdone, Petr Prochazka of the Institute of Physics Academy of Science of the Czech Republic presented *Multi-laser Accelerator Facility ELI Beamlines: Laser Safety Challenges*. It is so interesting to hear about all of the exciting work being done with lasers around the world.

The final session, "Program Management and Safety Standards," came much too quickly. Ken Barat discussed the changes that are under consideration for the ANSI Z136.8 and Major Edward Kelly talked about *Laser Eye Dazzling.* Your author finished off the workshop with a presentation on the *Benchmark Study of ANSI Z136.1 (2014) Controls requirements*.

Our Chair for this year's workshop gave closing remarks on a very successful event and the workshop concluded. All of the available talks have been posted to the workshop website and you can also find them on the EFCOG Laser Safety Task Group website.

Speaking of EFCOG, the Annual Laser Safety Task Group (LSTG)

Meeting was held in the afternoon before the formal DOE activities were completed. During the second workshop, there was also a University AMLSO Meeting held concurrently. Wes Marshall also held a Z136 TSC 7 Meeting.

This year's LSTG Meeting was quite important. We needed to select new officers; Mike Woods had been the chair for 3 years and Mendy Brown and Matthew Dabney had been the vice chair and secretary for two years.

Mike Woods nominated his successor and it was approved without objection, as was the remaining executive committee. The new **LSTG Executive Committee is** :

Jamie King (LLNL) chair
Matt Quinn (FNAL) vice chair
Tedi Criscuolo (PNNL) secretary

We have a very busy and exciting year planned for 2017 as several working groups were formed to tackle all kinds of new business. A couple of these are continuing our benchmarking study and looking at how laser safety programs are managed at each of the DOE Labs. We should be able to tackle this work as there is no DOE LSO Workshop scheduled for 2017.

Wilson Hall interior atrium. Location of vendor exhibition

Before closing the books on this workshop, none of it would have been possible without the great work of several different committees working throughout the year. They all deserve a huge THANK YOU:

Local Organizing Committee:
Matt Quinn (Chair)
Dave Baird
Jamie Santucci
Melody Saperston
Joy Pomillo

Technical Chair Committee:
Matt Quinn (FermiLab) - Host/ Chair
Matthew Dabney (NREL)
DeWayne Holcomb (U of T at Austin)
Jamie King (LLNL)
Steve Singal (DOE Headquarters)
Mike Woods (SLAC)

Session Chairs:
Matt Quinn, FNAL
Joanna Casson, LANL
Ken Barat, Laser Safety Solutions
Steve Singal, DOE HQ
David Baird, FNAL
Bill Ertle, RLI
Jamie King LLNL
Mike Woods, SLAC

And a special thanks to all of our Attendees, Speakers, and Vendors who have continued to support this event. See you in 2018 location TBD.

BE SAFE! Jamie

Welcome Dinner and LSO Appreciation Event

Left: Welcome Reception Dinner at the Two Brothers Roundhouse

Right : LSO Appreciation Event at Mike and Denise's Pizzeria

Workshop Survey Results

A majority of attendees reported that this was their **FIRST** workshop

10 MOST INTERESTING TALKS:

Ultrafast Pulse Laser Safety Eyewear Specifications Evaluation at NIST

Laser Incidents and Lessons Learned at DOE Labs since 2014

Laser Safety Aspects for Multi-Wavelength Laser Labs

Reflective Laser Safety Eyewear Advantages and Pitfalls

Risk Assessment for High Powered Lasers

Optics 101 Tutorial

Contributing Causes & Lessons Learned from 2015 Laser Eye Injury at NREL

Human Limitations as Contributing Factors in Two Recent Eye Injuries During Femtosecond Laser Beam Alignments

Searching for Dark Matter

Laser Safety Implementation at Fermilab's FAST Facility

These workshops are made great by the people who take the time and effort to participate in committees, serve as session chairs and present talks. It is not too early to start thinking about the 2018 LSO Workshop. If you think you might be interested in hosting the workshop, contact me.

BE SAFE! Jamie

Lessons Learned

Verify correct filter type and OD characteristics when receiving laser eyewear

Do you often just look at the color of your laser protective eyewear to determine its protective capabilities or use for laser application? This may have been fine in the past when there were very limited numbers of filter types. Today, manufacturers are formulating new dyes all of the time, trying to tweak the filter for best coverage and visible light transmittance. This recent Lesson Learned attests to this and reminds us to verify that our personal protective equipment will actually protect us.

A DOE site recently received incorrect laser eyewear instead of what was ordered. The packaging documentation for the eyewear indicated the filter type matched what was ordered. Inspection of the eyewear showed it had the correct frame and the tint of the filter looked correct. But when the OD characteristics for the filter were checked, they didn't match the filter type ordered and would not have provided adequate protection for the application intended. The OD characteristics matched another filter from the manufacturer which had a very similar shade of color, but different OD characteristics for the wavelength protection. The manufacturer was subsequently contacted -- they quickly identified the mistake , corrected a few other affected orders, and took measures to avoid a future recurrence of this problem.

ALWAYS INSPECT LASER EYEWEAR WHEN RECEIVING IT to ensure it is what you ordered and has the required protection before you put it into use!!

As a general principle, always inspect equipment when you receive it to ensure it has the correct technical and safety specifications.

When receiving a laser, make sure it is the correct model, that you have its operating manual and that its required laser safety labels are present and correct.

BE SAFE!