



Laser Pointers: Not For The Child Or Those With Child-Like Minds

It seems this laser pointer issue is not going away anytime soon.

By Scott Wohlstein, SLDI

London, England.
Philadelphia.
Australia.

Paranoia or just common sense has governments scrambling to protect their citizens from the hazards of laser pointers. From the contested viewpoints of both those that claim they have the answers (which change constantly), to those brave law enforcement souls who, during a tense encounter, find what is thought to be the sighting dot of a terrorist's MP5 on their chest, only to find out it is a child with his new laser-pointer trinket — just before the trigger is pulled....

But Just What Is Safe?

What is all the fuss about?

I have a hard time understanding how the apparent lack of a direct cause-and-effect relationship is the same as no related cause at all (or at least enough to cause concern) for some of my esteemed colleagues. Those of us in the safety profession must provide an appropriate balance between what is the truth (of the day) and consensus (reflected in standards and regulations), with a knowledge and understanding of those who will have to follow what we suggest.

History has shown us that scientists do make mistakes. There is more truth than we would like to admit in the scene from the movie *Men in Black* (Sony Pictures): "A hundred years ago, we all KNEW the world was flat. Fifty years ago, we all KNEW we were alone in the universe. Just think how much we'll know tomorrow."

I defy *anyone* in the field to state biological limits on which they would stake their career. As a related example, instead of dogmatically saying "Class II laser radiation is deadly," or "Class II laser radiation is perfectly safe," perhaps we should instead say, "Class II laser radiation is not *currently* known to cause any harmful effects." That way, we are allowed to explore the long-term, cross-sample effects and determine the truth over a period of time, not by extrapolated experiments. Let's not be embarrassed by our history, but rather continue to search for the truth. After all, isn't that what science is all about?

How Should We Approach Risk?

Think what you will about the nuclear/ionizing radiation industry, but their LNT and ALARA risk models seem to be two of the best risk management models for all but the most obscure scientific niches. (LNT stands for Linear No Threshold — no amount of radiation is allowable for exposure to a biological cell without creating the risk of cancer. ALARA stands for As Low As Reasonably Achievable.) However, it seems bizarre as even LNT/ALARA is now under fire by the Senate — considered "too conservative." It is as if there are no reasons to question the links between cancer and radiation, so why not relax the exposure practices. It is enough to make you wonder how much the Senate values health/life at this point.

The bottom line is simple: If there is even a possibility of creating a harmful condition, we should do everything we can to reduce the risk to an ALARA state.

What Needs To Be Done

Far be it for me to prescribe using the dark hand of the "Empire" (especially since I've chased my fair share of cats and an occasional human or two in my early days). But I am more educated now, just like the industry is supposed to be. We need legislation (specifically on a federal level) to work as follows:

- No selling or using laser pointing devices without undergoing a registration process (*i.e.* , firearms).
- Nobody under 18 can obtain nor own a laser pointer without consent.
- No selling of any retail laser device without first ensuring any/all labeling is in strict accordance to the federal standard. I can think of no other single most important aspect of the problem. Distributors and retailers take notice: According to the current Federal Code, 21 CFR 1040.10, (h) 2.i: "Applicable to all except Class I devices, warning logotypes (color optional) shall be displayed with the laser product being sold." Perhaps it's no wonder parents are buying laser pointers for their kids!!

We need to do something now, before more serious injuries occur (now or in the future), before Class IV laser pointer products emerge, and before IR-pointers emerge. All would make the present situation much worse.

Do you think that common sense would prevent misuse? Read on as I describe three situations that occurred over the past two years or so.

- A very large defense contractor had not one, but two laser accidents. One of the accidents destroyed the vision of an optical engineer. Although the company made a multi-million dollar settlement out of court for the accident, they could not see the value of auditing and training their staff to avoid such problems in the future!
- A laser product manufacturer had been told by one of its largest customers that its interlock design was

both inadequate and non-compliant to the federal code. Even after the customer's people were hurt by an accident caused by the poor design, the manufacturer remains non-compliant and complacent.

- A large laser manufacturer finds it perfectly safe to construct the guards on the laser systems they build out of Plexiglas, when they know the material is neither adequate, nor up to federal standards. Their guards fail routinely in the field putting their customers at risk.

Think about it. These are professionals in the laser industry. If they don't get it, how much safety-related intelligence do you think a child — or those with child-like minds — have?

Scott Wohlstein is president and photonics specialist at SLDI, P.O. Box 1190, Franklin, PA 16323. Telephone is 814/437-7354; e-mail is SDLI-s.wohlstein@kwid.com. Scott is also a member of the L&O Editorial Advisory Board.



Laser Pointers: The Laws Of Unintended Consequences

Is registration the right answer?

by Richard Cunningham, Editor-in-Chief

Scott Wohlstein's article on laser pointers (page 00) is much more of an opinion piece than the material that usually appears in bylined articles in *Lasers & Optronics*. Scott's article was the result of three or four conversations he and I had over the past year or so regarding the topic. He raises three interrelated, yet to a large degree separable, points regarding laser safety and omits a point about lawmaking in general that needs to be aired out.

At the broadest level of his argument, Scott cites three examples of fairly recent laser safety incidents. None of the three had anything to do with laser pointers. Instead, all three anecdotes make the point that the laser industry has become a good deal more cavalier about laser safety in recent years. In that, I agree completely. As a group, laser manufacturers and users are, well, sloppier than they were ten or fifteen years ago in regards to laser safety. Contributing factors are more, and less experienced, laser manufacturing personnel; many more end users, most of whom are far less knowledgeable about laser safety; decent luck to date; and what might be described as a distribution effect.

The last contributing factor refers to the fact that mishaps occur widely separated in time and space. In addition, there is rarely more than one victim per mishap. Furthermore, the total number of mishaps is relatively small in terms of the number of mishaps per laser operating hour.

On the other hand, as one of Scott's three anecdotes notes, perhaps the cost of insurance premiums to cover an occasional multi-million-dollar settlement is actually lower than the on-going costs of laser safety audits and personnel training. If that is the case, one or two things will soon occur. Either the insurance companies will catch on and ratchet premium rates to the skies, or settlement costs will soar as the tort lawyers catch the scent. Worse, both may occur more or less simultaneously. The threat of either one should be enough to alter the risk assessment equation.

A second point involves labeling requirements. CFR 1040 has a lot more to say about laser labeling than the section Scott cited. In particular, it is already unlawful to mislabel or not label laser sources. I can't recall any prosecutions in the past 25 years, which means either everything is properly labeled or it's too far down the criminality food chain for prosecutors to address. I'd like to believe the former.

Still, rumors have circulated and recirculated over the years that some fiberoptic transmitter systems have entered the U.S. market labeled as "data communications subsystems" (a true, but incomplete, description) rather than as "laser devices." Ostensibly, this occurred to avoid the scrutiny of U.S. Customs. If we assume some validity to these rumors, there is a direct bearing on laser pointers. That's because virtually every red-emitting laser diode used in laser pointers today, and many of the complete pointers, are manufactured offshore.

A third point involves enacting a registration law. Any registration law enacted today would have take notice of the millions (perhaps ten million or more?) of these devices already in use. It would also have to make possession of unregistered laser pointers a criminal act.

To do so would promptly move the action from the civil courts, where the "preponderance" of the evidence is supposed to tell the tale, to the criminal courts, where "beyond a reasonable doubt" holds sway. (Granted, the increased use of asset-forfeiture laws in civil courts as a substitute for criminal trials in drug and other cases is rapidly merging the two court systems, as are the tobacco and gun suits brought by civil authorities for cost recovery. But that's a topic for another day.)

It's hard to imagine federal or state prosecutors breaking away from tax evasion, cocaine cartels, and capital murder cases to prosecute someone for possession of a laser pointer. Perhaps an energetic prosecutor might go after a volume importer, assuming that U.S. Customs can tell the difference between crate of laser diodes and a similar crate of Zener diodes.

That, ultimately, brings us back to the difference between civil and criminal courts. The local laws about laser pointers passed to date involve the use and misuse of these devices, with criminal penalties for their misuse. For example, as the result of a couple of incidents involving the targeting of police officers in the past year or so, the Nevada State Assembly, earlier this year, made it a gross misdemeanor to target a uniformed police officer. If a person is convicted under this statute, the penalties include up to one year's paid stay at the county jail and/or a fine of up to \$2000. For targeting a civilian, the maximum penalties are halved.

In the general sense, this is a more effective approach to altering behavior than to attempt to control this particular risk through product liability laws.

At least, that's my take on things. Scott and I agree on the existence of a problem, but we disagree on how to effectively address it. So now we are turning it over to *L&O*'s readers. The accompanying box lists four alternative actions on laser pointers (and for these purposes only laser pointers as available today), in order of increasing governmental control, with distinct Reader Service numbers. Please write in the number of your choice on the Reader Service card in this issue and mail the card. If you have further comments, please e-mail them to Scott and me at the following two addresses:

richardc@vegaset.net, or SDLI-s.wohlstein@kwkid.com. We will publish the interesting responses in a future issue. Thank you.