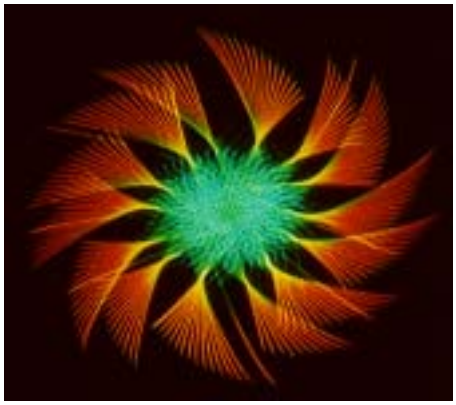
A Regulatory Program for Lasers and Intense Pulsed Light Sources



The Texas Department of Health Bureau of Radiation Control would implement a regulatory program for sources of nonionizing radiation for lasers and intense pulsed light (IPL) sources. The use of these devices in medical, dental, educational, industrial, and entertainment settings is rapidly increasing. Approximately 3,000 high-energy laser and intense pulsed light facilities exist in Texas. Most are not registered with the department.

During the past decade, serious eye injuries, skin burns, and at least one documented death in Texas from misuse and human error in the use of lasers and IPLs have occurred. The Bureau of Radiation Control (BRC) does not have sufficient personnel or resources to enforce current laws or rules for lasers and IPL sources. With the exception of medical and entertainment facilities that use lasers, few nonionizing inspections are performed in Texas.

Lasers (light amplification by stimulated emission of radiation) emit light at a fixed wavelength and are used in many medical, industrial, and consumer products. The high energy light beams emitted by lasers can be precisely focused to produce hundreds of holes in the head of a pin, and can produce a beam of light that is intense enough to cut a hole in a four inch thick steel plate. Lasers are used to weld detached corneas to surrounding tissue, scan grocery prices at supermarkets, record and reproduce music on compact discs, etch microscopic photomask dies used to produce computer chips, and are being used in many other products.

....both lasers and IPLs can cause severe burn injuries or death if misused.

Intense pulsed light (IPL) sources generate a broad spectrum of light energy. Practitioners can precisely customize the characteristics of the light energy according to each patient's skin type, specific condition, and location of the condition on the body. IPLs can also be used to produce laser-like effects during entertainment "laser light shows," and for consumer and industrial uses similar to lasers. When IPLs are used in a medical procedure, the wavelength of light is selected that is highly absorbed by the target (e.g., lesion, hair follicle, vein, etc.), but not by the surrounding tissue. This phenomenon is known as selective photothermolysis and is used to gain maximum therapeutic benefit with the least amount of damage to surrounding tissues and organs. The objective during treatment is to heat the target to a temperature high enough to destroy it without damaging the adjacent normal tissue.

Lasers and IPL devices used in many ways touch the daily fabric of our lives.

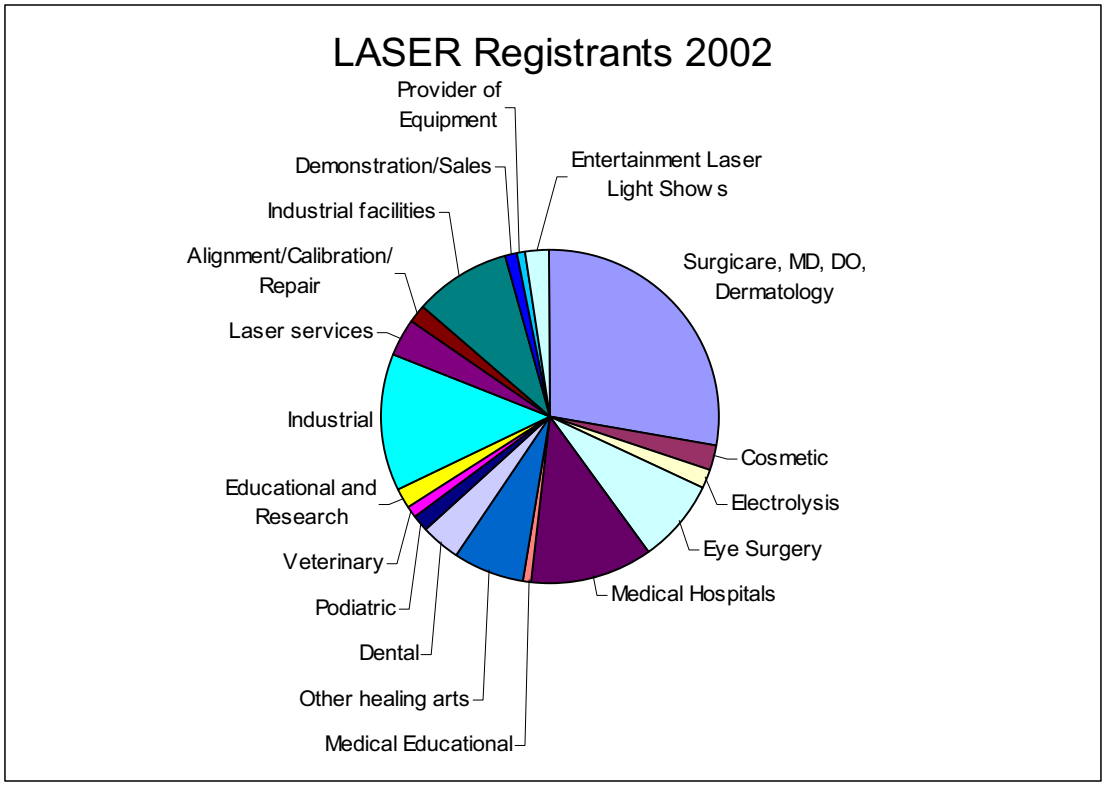
The use of high-power lasers and IPL in industry is rapidly increasing. Today, laser production is a billion-dollar industry. Manufacturers now design the whole of their manufacturing techniques around them. The use of lasers in medicine is also increasing dramatically.

Many of the lasers used in Texas are capable of causing serious permanent injury or death of users, patients, or member of the general public if not used safely.

High-power lasers and IPLs are being used to remove body hair and tattoos at an increasing frequency. The Board of Medical Examiners is proposing rules about delegation of authority to use IPLs and lasers.

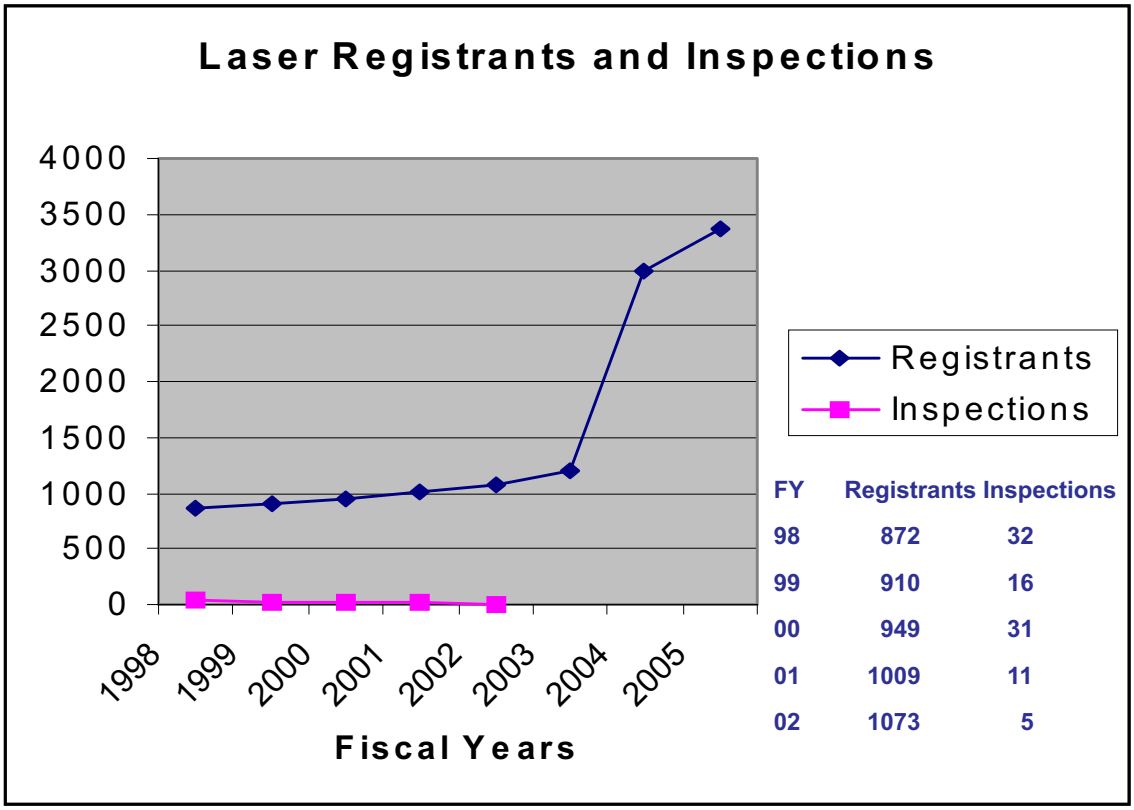
High power lasers are used in entertainment shows and have potential to do severe damage to eyes accidently struck by a laser beam. Many laser light shows are at "hard rock" concerts, where the young viewers eyes may be dilated due to drug use, thus providing the greatest potential for damage.

Safe use of these lasers and intense pulsed light sources is essential to protection of public health. BRC estimates that 3,000 high energy laser facilities exist in Texas, most of which are not registered, and the number of laser facilities is growing at a rate of 12 percent per year. A regulatory program to provide registration and inspection at each facility will help assure that all safety precautions are realized and taken by the laser users, patients, and clients.



An active registration and inspection program would be protective of public health and safety.

Currently 1,073 registered laser users exist in Texas, and 860 are due or overdue for an inspection. Inspections are only performed when responding to an incident or complaint, or when the agency receives notice that a laser light show will be performed in conjunction with a public activity or function.



FY	Registrants	Inspections
98	872	32
99	910	16
00	949	31
01	1009	11
02	1073	5

FY 02-03 Assumes 12% annual rate of increase
FY 04-05 Assumes approval of laser and IPL program and active solicitation

There is currently no active laser or intense pulsed light inspection program in Texas despite:

- a legislative authorization to do so
- the presence of approximately 3,000 active users in the state
- evidence that unregistered facilities have caused injuries to members of the public

This results from:

- a shortage of qualified inspectors
- a large backlog of due and overdue radioactive material and x-ray inspections and the lack of other resources and financial support

If funded, four laser and IPL inspectors assigned to the Bureau of Radiation Control will collectively perform about 750 inspections in FY 2004 and 850 inspections in FY 2005 and thereafter.

Conclusion

The use of lasers and intense pulsed light devices has dramatically increased during the past decade. More citizens are now at risk in the event of an accident or incident that intentionally or unintentionally exposes workers or members of the public to high energy light. The results of such an exposure could cause adverse consequences that include skin burns, eye damage or blindness, or even death.