LEAD NAVY TECHNICAL LABORATORY AT NSWCDD, DAHLGREN PULLS PLUG ON LASER HAZARDS

The Lead Navy Technical Laboratory at the Naval Surface Warfare Center, Dahlgren Division (NSWCDD) provides technical expertise for evaluating the safety of lasers and laser systems to be used by the Navy and Marine Corps. Because lasers provide pinpoint accuracy far beyond the capability of the naked eye, the Navy and Marine Corps use lasers in many ways. Lasers are used for target designation and rangefinding, covert illumination of targets and personnel, weapons aiming, target sighting, illumination for imaging systems and more. Mr. Sheldon Zimmerman, Laser Safety Program Manager, and Mr. Robert Aldrich, Laser Safety Engineer, at NSWCDD determine the risk of injury to personnel from the use of lasers and laser systems. They develop recommendations to eliminate the risk of injuries that might result from unintentional radiation to users, participants in force-on-force exercises, observers, or others.

Personnel use laser systems during field training exercise.

The Naval Surface Warfare Center, Crane, Indiana requested in October 2000 that NSWCDD evaluate the *SIMLAS+* laser system to assess the risk of eye injuries during combat training. The Marine Corps Warfighting Laboratory (MCWL), Quantico, Virginia also requested NSWCDD to evaluate the Lightweight Personnel Detection Device (LPDD) laser system in January 2001. The two systems are similar in their appearance and use.

Using safe weapon-mounted laser system during readiness competition.

The *SIMLAS*+ and LPDD laser systems are laser transmitters that are mounted on small arms, such as the M-16, during combat training and exercise simulations. During such exercises, the laser-mounted weapons are pointed directly at personnel assigned to play the roles of enemy soldiers. The Lead Navy Technical Laboratory determined that the *SIMLAS*+ and LPDD units were unsafe for personnel to use, due to a defect in the instruments that allowed the external beam waist to focus laser energy to hazardous intensities. The external beam waist means that the laser beam narrows down to a more hazardous, higher energy beam before diverging, as illustrated in Figure 1.

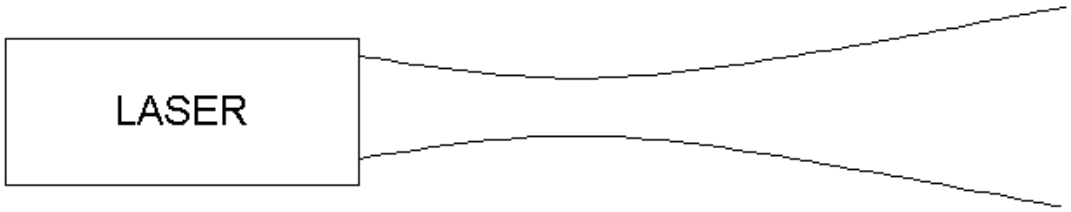

Figure 1. Laser Beam with a Beam Waist

Mr. Zimmerman and Mr. Aldrich reevaluated both devices due to the unexpected test results. When Mr. Zimmerman and Mr. Aldrich were attempting to measure the divergence of the laser beam, they determined that the external beam waist increased the hazard distance to a greater degree than had been expected for use in force-on-force exercises.

Because of this finding, the Navy Laser Safety Review Board (LSRB) prohibited the use of the *SIMLAS*+ and LPDD lasers by Naval personnel until the internal defect is corrected, as determined and approved by the Lead Navy Technical Laboratory and the LSRB. Mr. Aldrich and Mr. Zimmerman told the program offices that the problem could very likely be fixed easily and inexpensively by putting a lens in the plastic guard that screws onto the front of the lasers.

Exercise combatant lies prone in the grass aiming his M16 Rifle downrange during a readiness competition.

The Lead Navy Technical Laboratory's good judgment and expertise have prevented eye injuries by their recognition of a health hazard and by removing from service defective lasers that might otherwise have unnecessarily harmed U. S. Navy and Marine Corps personnel engaged in combat training exercises. Currently, safe lasers are being used in combat training as part of the Multiple Integrated Laser Engagement System (MILES).

Manning an M60 machine gun from the top turret of a Humvee. The machine gun is equipped with Multiple Integrated Laser Engagement System (MILES) gear.

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