As law enforcement officers we rely heavily on all of our senses to keep us alive during dangerous situations. Most experienced officers can tell you at least one harrowing story of how their life or the life of their partner was saved merely by paying attention to the smallest sensory cue. Furtive movement by a suspect’s hands, the smell of freshly fired gunpowder or the sound of rustling by a suspect hiding from you — all require that your senses are functioning at peak performance. So if we recognize that it is critically important to maintain our senses for tactical reasons (and even more importantly, for personal reasons) why do we as a profession continue to ignore the damage that we do to ourselves in training?

The law

While safety equipment and procedures have improved over the years, we still see officers who fail to adequately protect themselves from both temporary and long term hearing damage. Noise capable of causing such damage can come in a variety of forms. Typically they are referred to as persistent or impulse noises. Persistent noise could be generated by a piece of machinery like a generator, an engine in an armored vehicle or even a helicopter. Impulse noise is often occasional, yet instantaneous, sharp sounds such as the beating of drum, an explosion or gunfire. The U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) provides guidance for employers on reducing harmful noise in the workplace in 29 CFR 1910.195. Within this federal regulation, it is specified that the maximum permissible exposure limit (PEL) should not exceed 90 decibels (dB) averaged over an 8-hour time period and that typically applies to persistent noise sources. Since the noise generated by weapons is considered impulse noise, it falls into a different category of the regulation. The regulation specifies that impulse noise shall not exceed 140 dB sound pressure level (SPL). You should check with your organization’s safety officer to determine which federal or state safety regulations apply to you.

The danger

There are well over one million federal, state and local law enforcement officers employed in the United States,
each of whom are required to utilize
issued firearms during training on a
regular basis. Normal firearms training
exposes every law enforcement officer
to potentially damaging levels of impulse
noise, well over the 140 dB SPL. The
National Institute for Occupational Saf-
ety and Health (NIOSH) has conducted
research (Kardous et al. 2003; NIOSH
2003; Murphy 2007) into this potential
workplace safety issue. Sound measure-
ments were conducted on a variety of
commonly used firearms within the law
enforcement community at both indoor
and outdoor range facilities. Peak sound
pressure levels ranged from 155-168 dB
SPL (See Figure 1). Such sound pres-
sure levels can be even more dangerous
when they occur inside a small confined
space, such as when a weapon is fired
from within a fully enclosed armored
vehicle. Human exposure to such levels
could potentially cause tinnitus (constant
ringing in the ears), temporary and long
term hearing loss.

The solution
Both NIOSH and OSHA recom-
mand a systematic hierarchy of controls
to reduce the risk of any hazard. The
first is elimination or substitution. While
there are many alternatives to actual fire-
arms use in training, such as simulated
marking rounds and laser simulated tar-
geting firearms, they cannot completely
substitute firearms training for a tactical
team. The reality is that our operators
need to fire their weapons in training
scenarios that represent a real tactical
situation as closely as possible. What we
can eliminate is the need for additional
operators to be standing close to the
gunfire when they are not actually par-
ticipating in the training. Team firearms
instructors should consider segregating
those waiting to fire away from those
actually firing to reduce unnecessary
exposure to the impulse noises.

The second phase of the hierarchy
suggests the use of engineering controls
that can be implemented at range facili-
ties to reduce exposure. Proper firearms
range design can help drastically reduce
exposure to impulse noise. Even if you
are stuck with a range facility that lacks
appropriate design, teams can certainly
retrofit sound barriers and sound absorb-
ing materials to help reduce the overall
impact of the noise.

The third phase of this hierarchy
suggests the use of administrative con-
trols. Those include policies, proce-
dures and regulations that help reduce
the risk. This may come in the form
of safety procedures that limit the type
of ammunition utilized or by ensuring
that mandatory hearing loss prevention
education and training is provided.

The fourth and final phase is Personal
Protective Equipment (PPE). During the
NIOSH research, measurements were
also taken with the use of a head man-
nequin and hearing protection devices.
Resulting measurements clearly indi-
cated that the use of a combination of
both ear muffs and ear plugs together
reduced peak noise levels significantly.

For years, many of us in law en-
forcement have been told that either
ear muffs or ear plugs were sufficient.
This may not always be the case and
is largely dependent upon the type of
weapon and ammunition utilized as
well as the environment in which they
are fired. Tactical team commanders
and team firearms instructors should
evaluate the specific risks that their
operators are being exposed to on a
regular basis and consider developing a
hearing loss prevention program. Efforts
should be made to take accurate sound
level measurements and use that data
to determine the appropriate hearing
protection devices (HPD) to be used for
their specific training activities.

The average SWAT operator is likely to
fire tens of thousands of rounds over the course of his
or her career, the majority of which will be in training.
Appropriate selection of PPE — in this case HPD — is equally important. Manufacturers now offer a wide variety of HPD that not only reduce impulse noise levels but also integrate into existing communication systems. Regardless of the type your team selects, careful research and attention should be devoted to identifying the dB capability rating that the manufacturer indicates and determining if it is sufficient for the weapon, ammo and environment that you are most likely to be firing in during training.

The average SWAT operator is likely to fire tens of thousands of rounds over the course of his or her career, the majority of which will be in training. Comparatively, they will likely fire very few, if any, in an actual incident. Subsequently, our hearing protection programs should be focused primarily on our training environment and the dangers to which we expose our operators.

References:


About the author

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