Make Troop Training & Combat Operations Safer

MITIGATE BLAST OVERPRESSURE NOW

01

What is Blast Overpressure **(BOP)?**

Blast overpressure is a significant and growing concern in modern military and combat operations.

The shock waves radiate outward at supersonic speeds, increasing atmospheric pressure far beyond safe thresholds.

> "My friends were dying, people I knew were suffering. And then the question was, 'Why?'"
>
> **– Daniel Johnson**
>
> Adjunct professor, Roy H. Park Fellow and PhD candidate at the Hussman School of Journalism and Media at the University of North Carolina at Chapel Hill

In both training environments and actual combat zones, the abrupt, excessive, high-energy, rapidly expanding shock waves generated by explosions can cause severe and invisible harm.

As military strategies evolve and weaponry becomes more powerful, it's essential to have effective mitigation

IN MILITARY CONTEXTS, BLASTS MAY ORIGINATE FROM:

+ Artillery shells, grenades and improvised **explosive devices (IEDs)** in combat zones.
+ Controlled detonations, breaching operations and **munitions testing in training environments.**
+ Chemical explosions or **fuel-based detonations.**

02

The Longer it Takes to Mitigate Blast Overpressure, the More Troop Safety Becomes a Casualty of War

Military roles involving mortars, artillery, breaching and shoulder-fire weapons are routinely exposed to BOP, making it a daily occupational hazard.

They are not hypothetical risks - they are happening during training and not just in combat.

Blast Injuries

The effects of blast overpressure can be widespread, often targeting multiple body systems:

Brain

Mild traumatic brain injuries (TBI), memory loss, concentration problems, and mood disorders.

Pulmonary system

Pulmonary barotrauma **(blast lung)** is a leading cause of death in blast injuries and may include symptoms like difficulty breathing and hemorrhage.

Auditory system

Ruptured eardrums, hearing loss, and tinnitus frequently occur due to the pressure differential between the inner and outer ear.

Further jeopardizing troop safety and performance is the fact that military personnel **suffering mental and physical injuries during training that go undetected** carry those injuries into combat operations.

03

How do we Stop it?

Hybrid training that combines live fire and environmental designs with virtual simulated training are a proven method to reduce overpressure without reducing realism.

> "What happened to me and my friends was awful. Hopefully we can prevent it from happening to the next generation of service members."
>
> **— Daniel Johnson**
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> Adjunct professor, Roy H. Park Fellow and PhD candidate at the Hussman School of Journalism and Media at the University of North Carolina at Chapel Hill

ENGINEERING & ENVIRONMENTAL CONTROLS

Structural and environmental designs for live fire ranges can significantly reduce exposure when using live fire weapons in training:

+ **Blast shields and barriers** absorb and redirect the energy of a shockwave away from personnel
+ **Reflective surfaces** and orientation planning reduce wave amplification and improve dispersion
+ **Standoff distances** ensure personnel remain far enough away from the blast origin
+ **Controlled detonation zones** help contain and manage blast effects in training settings

VIRTUAL, SIMULATOR-BASED TRAINING

Virtual, simulator-based training is a proven method of mitigating blast overpressure without sacrificing realistic combat situations and performance from any weapon fired. No physical rounds or explosives are used.

Leading-edge virtual training solutions from InVeris are at the forefront of mitigating blast overpressure and advancing human performance. They're already tested, trusted and ready to serve. **No waiting. No R&D gap.**

> "Less is better in terms of exposure to blast overpressure. And we gotta get after that."
>
> **– Gen. Bryan Fenton**
>
> Special Operations Command

Screen-based systems use projected scenarios and BlueFire-connected weapon simulators to simulate combat situations. Virtual Reality (VR) headsets can place users in hyper-realistic combat environments. Augmented Reality (AR) overlays live drills with digital hazards or simulated blast scenarios.

Methods are safe, repeatable and customizable. Scenarios are highly adaptable and can be adjusted to specific training goals. They're also cost-effective in the long term, reducing ammunition costs and maximizing training effectiveness and budgets while preserving troop health.

InVeris simulated technology leverages it all. It's why InVeris products are recognized as proven, trusted, reliable training solutions for everything from smaller arms, rifles, machine guns and RPGs to mortars and heavy weapons.

Mitigating blast overpressure doesn't involve one solution, but a dynamic process that combines smart design, protective equipment, exposure monitoring, and innovative, leading-edge simulation-based training.

It also necessitates ongoing research integration and biomedical research; cross-disciplinary collaboration between engineers, neuroscientists and military strategists; and data feedback from wearables and simulation training into training system updates to **constantly improve training program effectiveness.**

All resulting in training solutions that safeguard troops physically and mentally while advancing human performance throughout their military service.

Put pressure on mitigating blast overpressure now. **InVeris stands ready to serve.**

The very dedication behind the InVeris suite of live fire and simulated solutions used for training in the United States is also being used remotely for combat operations training globally.

GET MORE INFORMATION AT
InverisTraining.com/Blast Overpressure/

Sources

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