Could Non-Lethal Weapons Lessen the Load for Soldiers?

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- Background of Non-Lethal Weapons (NLWs)
- Risk of Significant Injury Calculation
- Challenges incorporating use in the field
- Adding NLWs to Soldier's load
“Weapons, devices and munitions that are **explicitly designed** and primarily employed to **incapacitate** targeted personnel or materiel, while **minimizing fatalities**, permanent injury to personnel, and undesired damage to property in the target area or environment. Non-lethal weapons are **intended to have reversible effects** on personnel and materiel.”
- Counter-Personnel
  - Designed to Move, Deny, Disable or Suppress

- Counter-Materiel
  - Designed to Stop or Disable Vehicles, Vessels, and Aircraft; Deny Access; and Divert Aircraft
Effectiveness = Lethality

Operating Region Of Lethal Weapons

Desired Effect

Significant Injury

Desired Operating Envelope for NLW
- **RSI** is the probability that a NLW system will cause a significant injury when used as intended.

- **Reversibility**: The ability to return the target to its pre-engagement functionality. It is usually measured by the time and level of effort required for recovery of the target. *(DoDI 3200.19)*
• DODI 3200.19, “Significant” injuries include:
  a) any injury requiring Health Care Capability indices 1 or 2
  b) permanent injuries
  c) death
\[ P_{RSI,\text{Injury}} = P_{IO} \times P_{SI} \]

- \( P_{IO} \) is probability that injury will occur given the nature, location, and intensity of the insult.

- \( P_{SI} \) is probability that injury will be significant (HCC1+ or permanent) given that type and severity of injury occurs.
RSI Diagram – Single Injury Modality

1000 Occurrences

No Injury

PIo

750

Injury

Poi

250

nPI

236

HCCo

165

HCC ≥1

71

PI

14

HCCo

0

HCC ≥1

14

RSI = (250/1000) * ((71 + 14)/250) = 0.085 or 8.5%
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- Public Acceptability
- CONOPs / TTPs
- Understanding of associated RSI
- Belief that it would add weight to the already overburdened Soldier
- Training on NLW
An intent of NLW is to reduce collateral effects
- Minimize the damage to a building or vehicle
- Minimize the injury potential for bystanders
Potential to provide more capabilities by including NLW ammunition

Possible to have multi-use NLW, for example a laser dazzler
Some NLWs have long ranges and could be used to support the purpose of the mission from a distance.

Design of NLW is to determine intent allowing for less armor as the Soldier would be able to stay further away.
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Questions?