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Evaluation of non-lethal hand grenades

J.J.M. Paulissen, M.Sc.

TNO Prins Maurits Laboratory, Rijswijk, The Netherlands

The Royal Netherlands Army (RNLA) is searching for a Non-Lethal Hand Grenade (NLHG), as a suitable successor for the obsolete attack hand grenade that is currently in use. The NLHG will be employed during conventional combat operations, but should also be suitable for use during peace support operations. Possible candidates are NLHG that produce bright flashes of light, loud bangs, impacting pellets, or a combination of the previous.

TNO Defence Research assessed the weapon effects produced by NLHG so that the RNLA is able to narrow down the vast range of available products. The suitable NLHG possesses a sufficiently high probability of incapacitating the adversary, while at the same time the risk of lasting injuries is sufficiently low.

Because in-depth knowledge about non-lethal weapon effects as well as the human responses is limited, a substantial part of the research effort focussed on the weapon-target interaction process. A total of four experiments were conducted, both with human and animal test subjects, that together describe the human response to impulse sounds and light in terms of the level of disruption of a shooting task. The outcome of the experiments provided more insight in the nature, severity and duration of a disrupted task. This enabled the development of a 'dose-response relationship' that is applied in the evaluation of the effectiveness of flash-bang NLHG. Furthermore, the effect of impacting pellets was explored to yield an insight into the attainable responses.

The effects of five different NLHG technologies are reviewed in relation to their operational context. This resulted in the identification of the most suitable technologies and an impression of the basic munition properties that should be aimed for during procurement.

Keywords:

- hand grenades
- flash-bang
- pellets
- dose-response