



Nanosecond Electrical Pulse (nsEP)

Non-Lethal Weapons Research and Technology Development
Industry Day
22 June 2012

Wesley Burgei
Officer of Primary Responsibility, nsEP

<http://jnlwp.defense.gov>



Background

- Nanosecond Electrical Pulses (nsEP) have the potential to cause a non-lethal disabling effect.
- Electrical parameters are much different than Human Electromuscular Incapacitation (HEMI): durations of hundreds of ns and peak potentials of tens of kilovolts under load.
- The JNLWD is focused on understanding underlying bioeffects and developing and demonstrating nsEP technology that increases the standoff range and duration of effect compared to existing disabling technology while minimizing the risk of significant injury (RSI).



Technical Objectives

- Develop predictive scientific model that correlates nanosecond electrical pulse parameters to the efficacy/effectiveness of the stimulus and risk of significant injury (RSI).
- Develop and demonstrate nsEP device prototypes

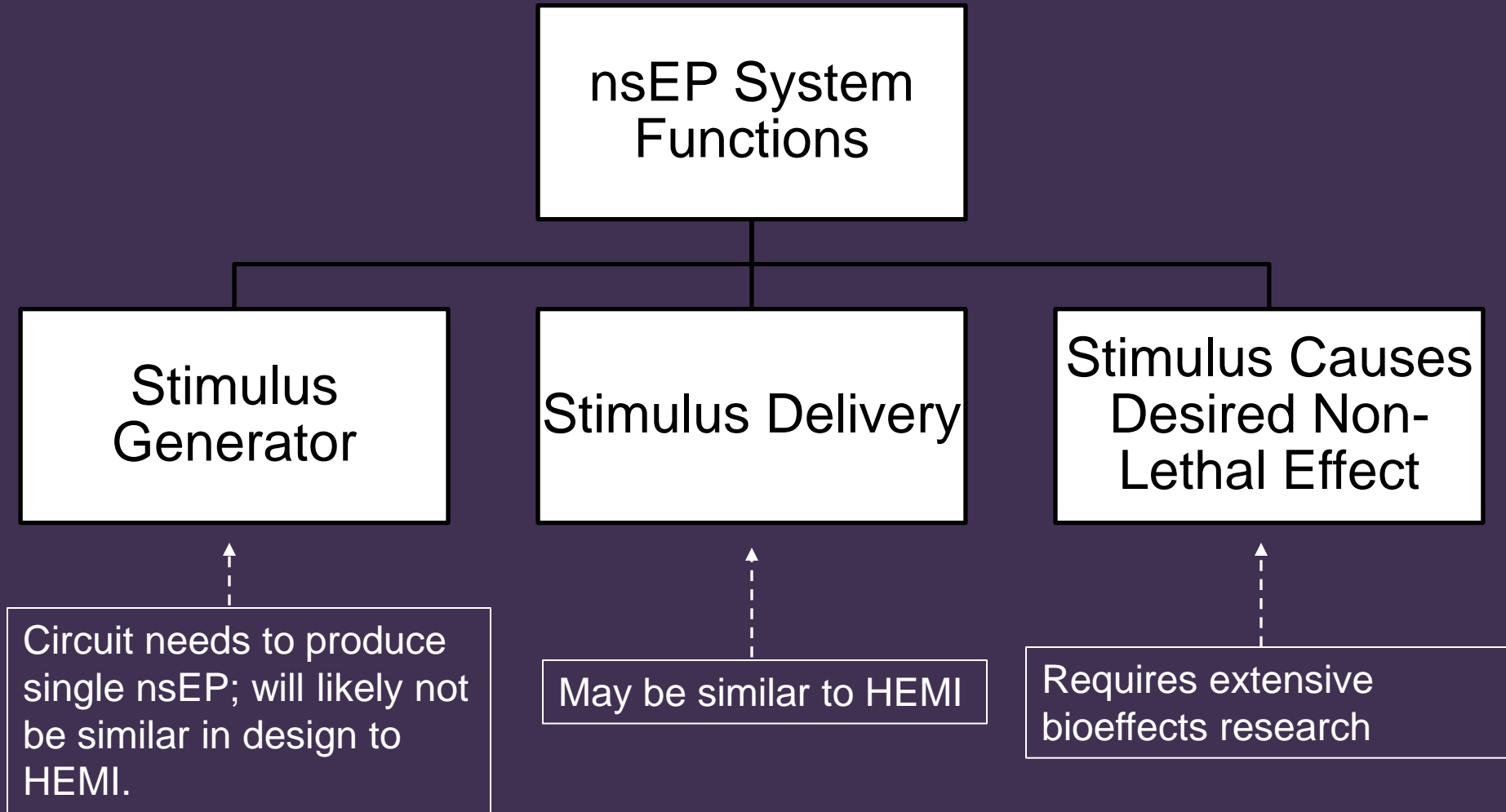


Relevant Work

- nsEP Bioeffects
 - Performers:
 - Old Dominion University
 - University of New Hampshire
 - Focus:
 - Investigate the potential non-lethal weapons effects of nsEP in vivo using animal models.
 - Correlate device parameters to effects/risk of injury
- Hardware Development
 - Naval Surface Warfare Center - Dahlgren, USN
 - Focus: Hardware feasibility study



Research & Development Tasks





Research & Development Tasks

General types of tasks that may be required for nsEP Research and Development:

- Bioeffects research to include animal and human subject research to characterize and verify efficacy and risk of injury
- Prototype development, testing, and demonstration nsEP system
- Modeling and simulation of nsEP bioeffects
- Systems engineering and technology integration



Capabilities

General capabilities and expertise that may be required to execute planned R&D nsEP tasks:

- Engineers/Scientists with expertise in high voltage electronics, ballistics, mechanics, materials and systems engineering
- Facilities and equipment to build and test prototype systems
- Biomedical researchers with expertise in bioelectricity and other fields relevant to nsEP bioeffects research
- Accredited institutional controls for bioeffects research:
 - Institutional Review Board (IRB)
 - Institutional Animal Care and Use Committee (IACUC)
- Computational scientists and engineers to build computer based models and run simulations



Questions?

Please submit questions by 29 June 2012:

wesley.burgei@usmc.mil

and

alicia.owsiak@usmc.mil