

An Introduction to Pulsed Power Systems

IEEE PES Cleveland Section & IEEE CSU Student Branch

Cleveland State University – Tuesday September 17th, 2024 4:00PM – 6:00PM

Washkewicz Hall - 2121 Euclid Ave., **Room WH 405**, Cleveland, Ohio 44115-2214 **2 CPD Hours for PEs**

Parking available at CSU Visitor Lot #54 on E24th Street between Payne & Chester Avenues, behind the Langston Dorm.

**Speaker: Allen Morinec Jr., R&D Engineer / Pulsed Power & RF Team Leader
from the Detonation Science & Technology Group at the Los Alamos National Laboratory.**

Pulsed power is the science and technology of accumulating electrical energy over a relatively long period of time and releasing it almost instantaneous, thus amplifying in the instantaneous power by millions to billions of times. Applications include food processing, inertial confinement fusion, radiation effects, fundamental physics, particle accelerators, directed energy systems, medical devices, and more much. Similarities and differences between pulsed power and traditional power systems (the electric utility grid) will be highlighted. The talk will include topics from the following areas and present the history of the field from early high voltage radar technology to analyzing modern pulsed power sources capable of instantaneous power in the 100s of TWs and currents in the 100s of MAs.

Seminar Topics Include:

- Introduction to Pulsed Power
- Basic Circuits
- Capacitive, Inductive, and Mechanical Energy Storage
- Marx Generators
- Pulse Shaping Topologies
- High Voltage Breakdown and Physics
- Solid State Switching
- High Power Vacuum and Gas Switches
- Pulse Generators
- Voltage Multipliers
- Diagnostic Considerations
- Compact and Explosive Pulsed Power
- Railguns
- Accelerators & Modulators
- Applications
- Z-Machine, DARHT, and other modern sources