

Critical Infrastructure Resilience Project Area



Science and Technology

PROTECTING CRITICAL INFRASTRUCTURE

Critical Infrastructure Resilience (CIR) is vital to national economic security, public health, and safety. The nation's critical infrastructure (CI) is dependent upon physical and electronic-based systems for many applications to maintain operations that are at risk from man-made and natural disasters. The use of GPS for position, navigation, and timing (PNT) is essential for critical infrastructure such as the electric grid, telecommunications, transportation, and emergency services. Other electronic capabilities with critical infrastructure ecosystems are susceptible to attacks or natural occurrences of electromagnetic pulses (EMP) and geomagnetic disturbances (GMD). CI owners and operators (CI O&O) lack solid, data-driven information on actions and mitigations for risk management.

CRITICAL RESEARCH FOR CRITICAL INFRASTRUCTURE

Research from the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) CIR project will inform best practices and provide tools to CI O&O on how to prepare and protect PNT capabilities and electronic systems against an EMP or GMD event. Activities focus on testing, evaluating, and validating the impacts on select, prioritized CI, including 5G infrastructure, to provide industry with actionable, timely information to protect systems prior to buildout of new infrastructure.

This will be accomplished through PNT research supporting the Cybersecurity and Infrastructure Security Agency (CISA) to enhance security and resilience of both government and private sector PNT CI by addressing sector risks, mitigation options and increased opportunities for industry to innovate with S&T and to learn best practices from other CI O&O.

EMP resiliency work builds knowledge and expands understanding of impacts and effects of EMP events on CI. The objective is focused on providing useful information and products to inform strategy and policy. The research will inform best practices and provide tools to CI O&O on how best to prepare and protect against EMP and GMD events.

PROJECT IMPACT

- This project will use PNT research and development efforts to promote the adoption of standards and techniques to develop more resilient PNT-related environments.
- This research will enhance security and resilience of both government and private sector critical infrastructure from disruption, corruption, and dysfunction of infrastructure systems by addressing sector risks, mitigation options, and opportunities for industry to innovate novel solutions.

ACCOMPLISHMENTS

- Resilient PNT Reference Architecture and Resilient PNT Conformance Framework version 2.0 published in 2022.
- Electromagnetic Pulse Mitigation: Best Practices for Critical Infrastructure Operators and Owners" published in 2022 (released jointly by S&T and CISA).
- Federal Emergency Management Agency Integrated Public Alert & Warning System (IPAWS) High Altitude EMP Testing (HEMP)

UPCOMING MILESTONES

- PNT Best Practices; Financial Services PNT Best Practices; PNT Trust Inference Engine (PNTTNG) Application Report. (Q4 FY23)
- Sandia National Laboratories (SNL) EMP/GMD Environment Assessment. (Q4 FY23)

PARTNERS

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