

DTRA SBIR Challenge:

- 1) EM attack shuts down grid & infrastructure
- 2) Restoring grid may not be possible
- 3) Needs EM-protected microgrids & energy loads

Instant Access Networks (IAN) SBIR Response:

EM-protected microgrid **systems** --DTRA/IAN

Contract: HDTRA1-16-P-0025

- Integrates 4 subs and 40 collaborators
- Uses energy savings to help self-fund

RAMS™ Rapid Deployment Solution

Resilient: EM and cyber “island-mode” resilience

Adaptive: Power management system protects and models energy for quick deployment/growth

Modular: 50 kW to 250 kW, 1 MW+ self-funded rapid growth (fixed, transportable, modular)

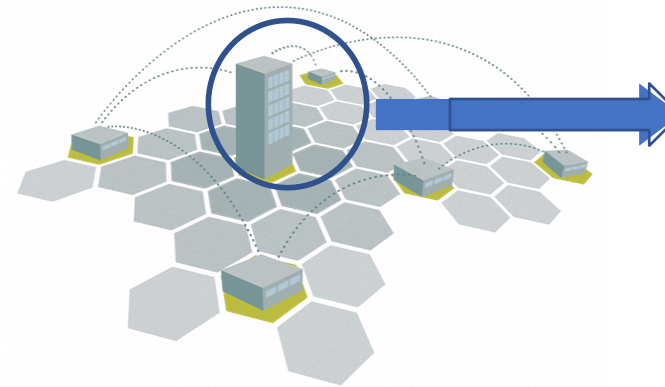
Microgrid: Energy generation, storage, controls, & communications linkable to other protected “islands” in an “Archipelago of protected islands”

System: Linked energy loads provide “out-of-band” power management and energy savings

The Archipelago™ RAMS Scenario

(IAN Contact: Chuck Manto, CEO

cmanto@stop-EMP.com (410)-991-1469)



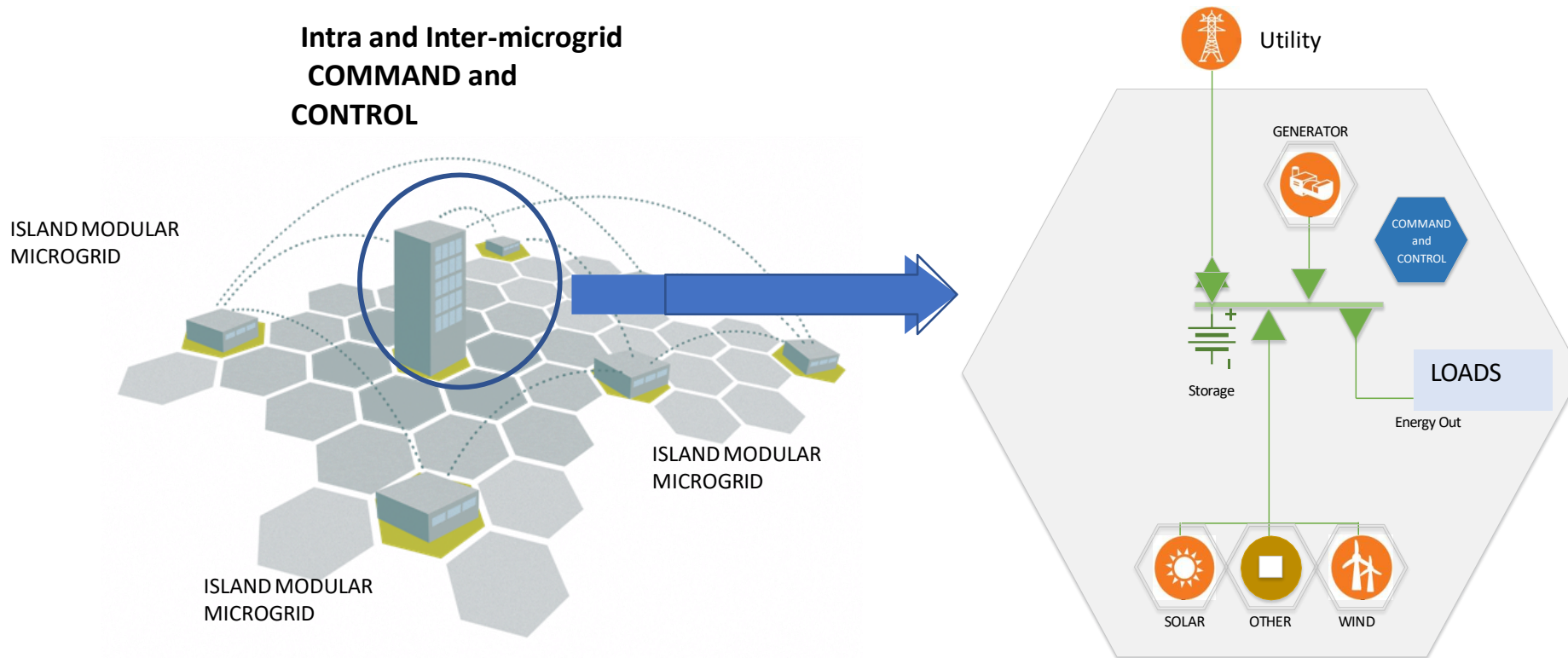
**Intra and Inter-microgrid
COMMAND and CONTROL**

RAMS Benefits:

- 1) RAMS creates cyber and EM resilient systems
- 2) RAMS can be funded largely by operational savings from energy efficient microgrids with energy efficient uses of the energy (comms, hospitals, data, water...)
- 3) Expedited IAN SBIR Phase 2 or 3 contracts for EM-protected microgrid SYSTEMS including all energy uses

The Archipelago™ Scenario

Independent EM-protected Resilient Adaptive Modular-Microgrid Systems (RAMS)™ are deployed and rely on local operational inputs for island-mode operation. A protected out-of-band (OoB) management network within the microgrid can also connect the islands to form an Archipelago for coordinated operation and situational awareness. This maintains command and control and facilitates restoration of the larger grid and infrastructure.



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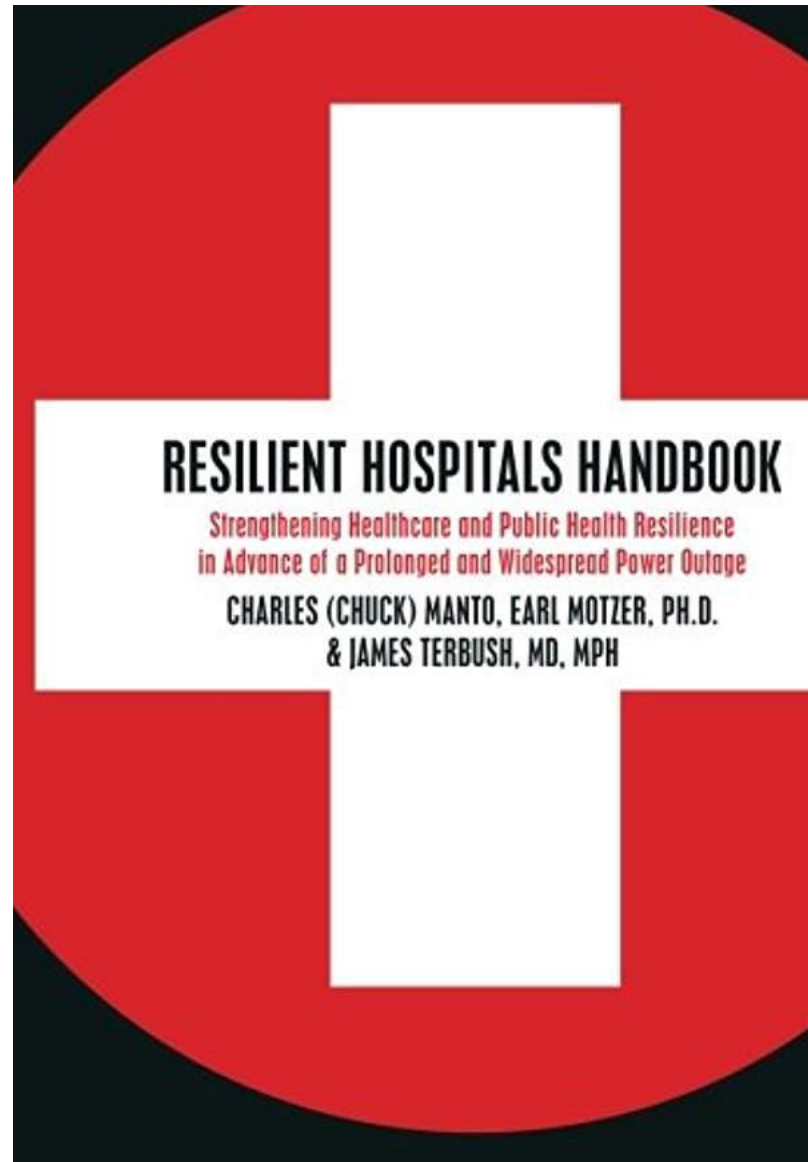
https://www.amazon.com/s?k=resilient+hospitals+handbook&ref=nb_sb_noss

Westphalia Press:

<https://westphaliapress.org/2017/12/18/resilient-hospitals-handbook/>

ASPR:

<https://asprtracie.hhs.gov/technical-resources/MasterSearch?qt=resilient+hospitals+handbook&limit=20&page=1&CurTab=0>

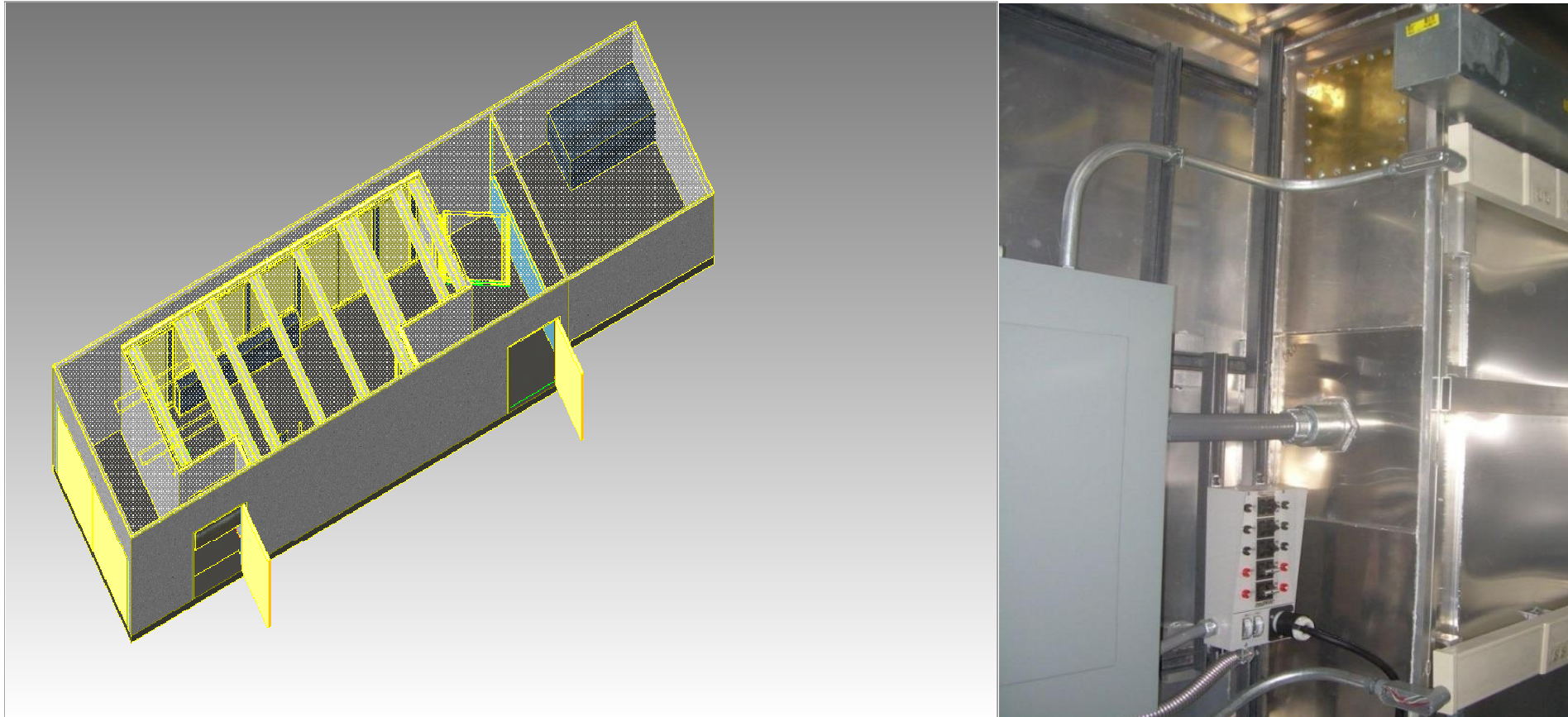


EMP Safe Micro Grids Examples



Modular & Scalable Mitigation Strategies

IAN's EMP Protected Mobile Command Center



Executive Order 13865 March 26, 2019

Coordinating National Resilience to Electromagnetic Pulses

- By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:
- **Section 1. Purpose.** An electromagnetic pulse (EMP) has the potential to disrupt, degrade, and damage technology and critical infrastructure systems. Human-made or naturally occurring EMPs can affect large geographic areas, disrupting elements critical to the Nation's security and economic prosperity, and could adversely affect global commerce and stability. The Federal Government must foster sustainable, efficient, and cost-effective approaches to improving the Nation's resilience to the effects of EMPs.
- <https://www.federalregister.gov/documents/2019/03/29/2019-06325/coordinating-national-resilience-to-electromagnetic-pulses>