

Plan for Tomorrow:

Critical Infrastructure Risk and Resilience in the USVI

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Agenda:



A Traditional View of Risk

CISA Strategic Risk Management Process



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CISA Strategic Risk Management Process



CISA = Cybersecurity and Infrastructure Security Agency, https://www.dhs.gov/cisa

Perspectives on Resilience: NIST + FEMA BRIC



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We find these views of risk and resilience limiting.

Plan & Prepare

We think about resilience differently.





Woods, David D. "Four concepts for resilience and the implications for the future of resilience engineering." Reliability Engineering & System Safety 141 (2015): 5-9.

Robustness: Composite Power Poles

https://viconsortium.com/VIC/?p=76179

Extensibility: Emergency Generators

https://www.ecmag.com/section/yourbusiness/backup-generators-anew

Rebound: Deployable Line Crews

anna

750

0827

ADANGER

USDOT# 2347280

https://www.hauglandgroup.us/projects/

Adaptability: Energy Transition

https://www.usatoday.com/stor y/opinion/2018/10/14/

"No plan survives contact with the enemy" –Helmuth von Moltke

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Situational Surprise

- compatible with previous beliefs
- failures and system responses are well-modeled or measurable
- can be averted or mitigated by information about the future
- learning from situational surprise seems easy

Fundamental Surprise

- refutes basic beliefs about 'how things work'
- one cannot define in advance the issues for which one must be alert
- advance information on fundamental surprise actually causes the surprise
- learning from fundamental surprise is difficult

*References:

- Lanir Z. Fundamental surprise. Eugene, OR: Decision Research. 1986.
- Eisenberg, Daniel, Thomas Seager, and David L. Alderson. "Rethinking Resilience Analytics." *Risk Analysis* 39, no. 9 (2019): 1870-1884.

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TROPICAL STORM DORIAN 5:00

LAT: 15.3°N LOI 80 MI W OI

WINDS: 50 MPH PRESSURE: 100 MOVING: WNW

Martinique

Antigua

Puerto Rico

Barbados

Grenada

Trinidad

https://viconsortium.com/VIC/?p=77910



Hurricane Resistant Composite Pole Toppled in Dorian But Not By Wind *Correction*

https://stjohnsource.com /2019/08/30/





Workmen raise another composite pole on St. John. The new poles are replacing wooden poles that essentially haven't changed significantly in more than 100 years.

Resilience is not what you *have*, it's what you *do*

How to Adapt to Surprise: *Improvise*



How to Adapt to Surprise: Improvise



How to Adapt to Surprise: Improvise

Tech: Dials Social: Decisions

Example: SAAL Processes in Water Distribution

Technological

Social

Sensing: Data collection, curation, & devAnticipating: Engineering modelsAdapting: Design & operational plansLearning: Updating, reassessing

Sensing: Boots on the ground Anticipating: Experience, expertise Adapting: Real decisions Learning: Retaining, reframing

Key Takeaways

Risk management is not sufficient. Surprise will happen. Resilience is not about what you have, it's about what you do.

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What we want: Resilience

Robustness, extensibility, rebound, adaptability

What we need to do:

Sensing, anticipating, adapting, learning

How do we understand and improve resilience and adaptive processes? For yourself, your organization, your community, the VI, ...

Goal: Prepare for Tomorrow

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