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Critical Mission Support Through Energy Security

Development of an Army Energy Security Assessment Model

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Purpose

- Provide an overview of the Army Energy Security Assessment (ESA) methodology development being developed by Concurrent Technologies Corporation and monitored by the US Army Corps of Engineers (USACE), Engineering Research and Development-Construction Engineering Research Laboratory (ERDC-CERL)
- Discuss a real world energy security assessment scenario that identifies potential risks to energy availability, quality, and potential solutions

Program Objectives

- Develop/enhance the draft energy security assessment methodology demonstrated under the Army Power and Energy Initiative (APEI)
  - Leverage existing processes (e.g., Anti-terrorism/Force Protection)
- Validate the methodology at an Army installation
- Demonstrate at four additional installations for implementation toward improving their energy security posture
- Refine for potential use across the Army
- DD-254 Secret Level Project Classification

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Program Drivers

- DoD Goals include increasing Energy Security
  - EPACT05
  - Defense Science Board Recommendations
  - Executive Order 13514 (supersedes EO13423)
  - Energy Independence and Security Act of 2007
  - NDAA of 2009
  - NDAA of 2010
- 2010 DoD QDR defines Energy Security as:
  - "…having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs. "

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Program Drivers

- Army-specific goals – Army Energy Security Implementation Strategy (AESIS)
  - ESG 4: Assured Access to Sufficient Energy Supply
    - Objective 4.1: Implement Energy Security Plans (ESPs)
    - Metric 4.1a: Provide an Army-level template for energy security plans
    - Metric 4.1b: Identify all Army critical facilities/installations
    - Metric 4.1c: % of installations with ESPs
    - Metric 4.1d: Review energy security and reliability considerations with utility suppliers and privatized utility service providers annually in accordance with the installation's ESP
    - Metric 4.1e: Implement recommendations to achieve reliable and adequate energy supply for critical facilities/installations

Program Drivers

- Observations from the field
  - Many Army Installations have energy systems (to include backup generation) that require modernization
  - It is a challenge for Army Installations to identify and prioritize Energy Security Improvements
  - Typically no regular interface with DES, DPTMS and others who also analyze vulnerabilities
  - Many installation energy security assessments/plans are out of date
  - AT/FP assessments are focused on a specific location's ability to deter and/or respond to a terrorist event - energy disruptions and effect on mission execution are a secondary outcome
  - Other mandates and requirements result in an inability to focus on priority tasks

Program Benefits

- A standardized approach will provide a consistent methodology to assist installations in identifying mission-related:
  - Critical Facilities/Functions/(Sub)Components
  - Electrical demands and infrastructure needs for those Critical Facilities
  - Potential energy security vulnerabilities
  - Prioritize the energy security risks
- Provide actionable project solutions and business case justification for energy system enhancements
- Provide energy security documentation for future mission planning and energy system planning
- Ensure continuity of operations / enhanced mission capabilities

Program Approach

- Establish an Army-level collaborative working group
- Working group expectations
  - Review current/enhanced ESA methodology
  - Provide candid feedback to improve the methodology
    - Identification of Critical Facilities/Infrastructure
    - Vulnerability and Risk Management
- Continue to provide support to enhance and define the methodology

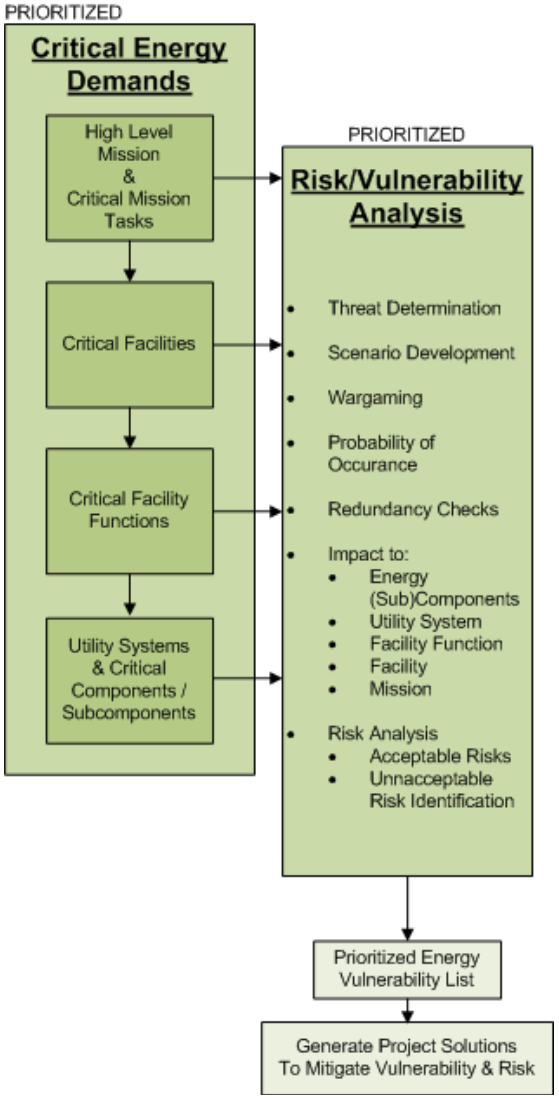
WG Members

- Assistant Chief of Staff for Installation Management (ACSIM)
- Deputy Assistant Secretary of the Army for Energy and Partnerships (DASA-E&P)
- ERDC-CERL
- Headquarters Department of the Army (HQDA)G-3/5/7
- HQDA G-3, Critical Infrastructure Risk Management (CIRM) Branch
- Installation Management Command (IMCOM)
- Pacific Northwest National Laboratory (PNNL)
- US Army Corps of Engineers (USACE), Defense Critical Infrastructure Program (DCIP)

Critical Energy Demands?

- Many different critical asset lists are maintained
  - Mission Essential Vulnerable Areas (MEVA)
  - High Risk Target (HRT)
  - Directorate of Public Works (DPW) Critical Facilities List
  - Task Critical Assets (TCAs)
  - Joint Staff Integrated Vulnerability Assessment (JSIVA) Data
  - Risk Management Data Package (RMDP) Data
- Currently, these lists are not integrated nor are energy issues specifically evaluated
- Objective of our ESA do so

ESA Methodology



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Mission Decomposition

- Mission Decomposition will lead to a list of Critical Mission Tasks to prioritize
  - Mission Type
  - Mission Description
  - Mission Task
  - Mission Task Description
  - Mission Task Duration
- Mission Owners = Tenants, Units and Garrison
- Will loss of this Mission Task cause failure or severe degradation to the Mission?

Critical Facility Prioritization

- Mission Task Analysis will lead to a list of critical facilities
- Ranking of facilities by:
  - DES
  - DPW
  - DOL
  - DOIM
  - MEVA List
  - HRT List
  - TCA List
  - Mission Command Preference
  - Garrison Command Preference
- Interdependency Rating for Facilities to Critical Mission Tasks
- Will loss of the Critical Facility, cause failure or severe degradation to the Mission?

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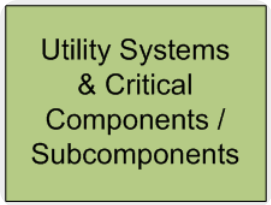
Critical Facility Functions

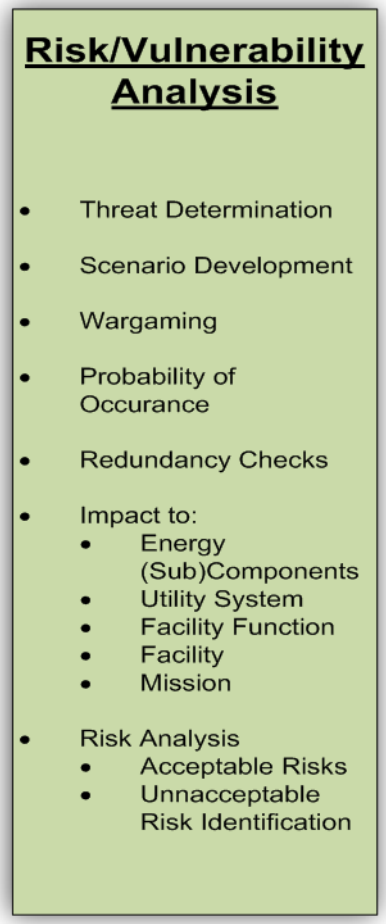
- Identification of critical facility functions will determine the interdependency of Utility Systems
- Basis of Analysis
  - Energy needs to support the Mission
  - Adverse impact to Mission
  - Alternative Functionality
  - Time to Restore
  - Time to Impact Mission
- Will loss of this facility function, cause failure or severe degradation to the Mission?

Analysis of Utility Systems



- Identification of Critical (Sub)Components
  - On-Site
  - Off-Site
- Critical (Sub)Components can affect the functionality of:
  - Critical Facilities
  - Critical Facility Functions
  - Utility Systems
- Critical (Sub)Components can be identified as single points of failure

Risk and Vulnerability Analysis



- Determine reality-based Initiating Events
- Develop reality based threat scenarios
- Analyze the prioritized Critical Facilities using a Wargaming process to determine
  - Probability of Occurrence
  - Severity of Impacts
  - Risk Level/Acceptance
- Monte Carlo regression to quantify
- Examine results to determine vulnerabilities
- Develop potential solutions to reduce risk/vulnerabilities

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ESA Process Example

- Mission Decomposition
  - Sample Mission Description: ***Strategically deploy, conduct forcible assault, and secure key objectives for follow-on military operations in support of U.S. national interests***
  - Sample Mission Task: ***Conduct Command, Control, Communications, Intelligence, Surveillance and Reconnaissance from a central location***
  - Sample Task Description: ***Utilize Command Control HQ and worldwide communications to execute mission***
  - Sample Task Duration: ***One month***
  - Mission Owner(s): ***Unit Commander***

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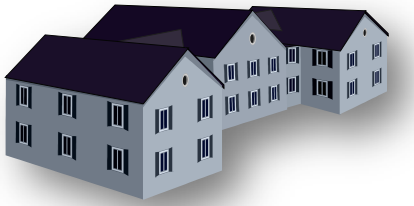
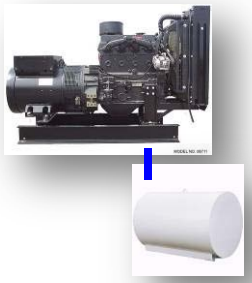
ESA Process Example





- Critical Facility: ***Command HQ Building***
- Critical Facility Function(s): ***HVAC, Data, Communications***
  - Energy needs to support the Mission - ***Electricity***
  - Adverse impact to Mission - ***Yes***
- Identification of Critical (Sub)Components
  - ***On-Site Distribution Line, Substation (Transformer)***
  - ***Off-Site Transmission Line, Substation (Transformer)***
- Alternate Functionality - ***Backup Diesel Generator***

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ESA Process Example

- Potential single points of failure
  - ***Dual electric primary feed to facility co-located on single pole***
- Potential solutions to reduce risk/vulnerabilities
  - ***Work with Utility provider to separate primary feeds (Utility investment)***
  - ***Provide redundant backup generator, secure logistics plan for backup generator refueling during emergency conditions***

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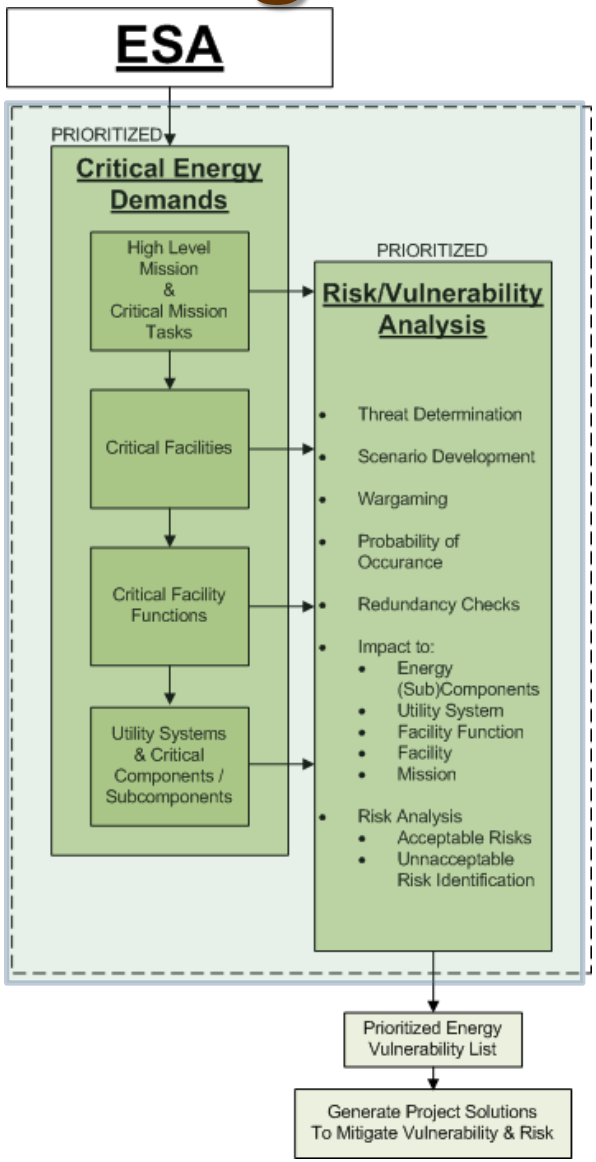
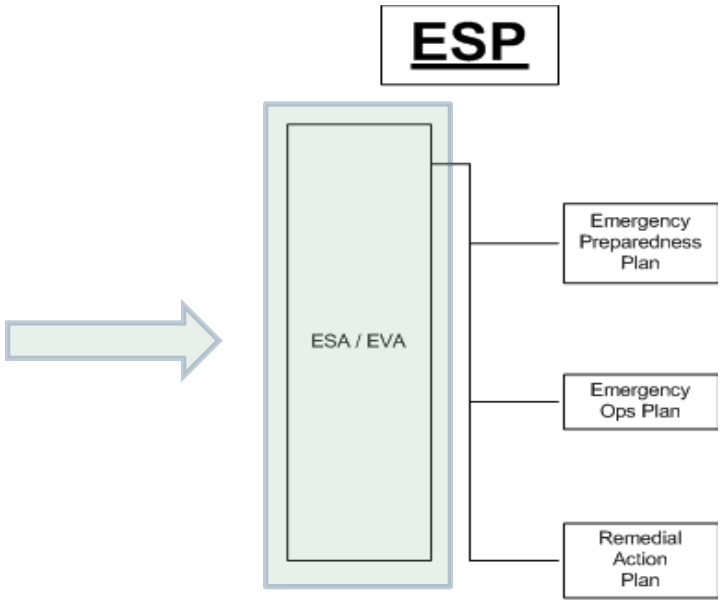
Integration with ACSIM ESP





* Currently working with PNNL to Integrate into the ACSIM ESP template

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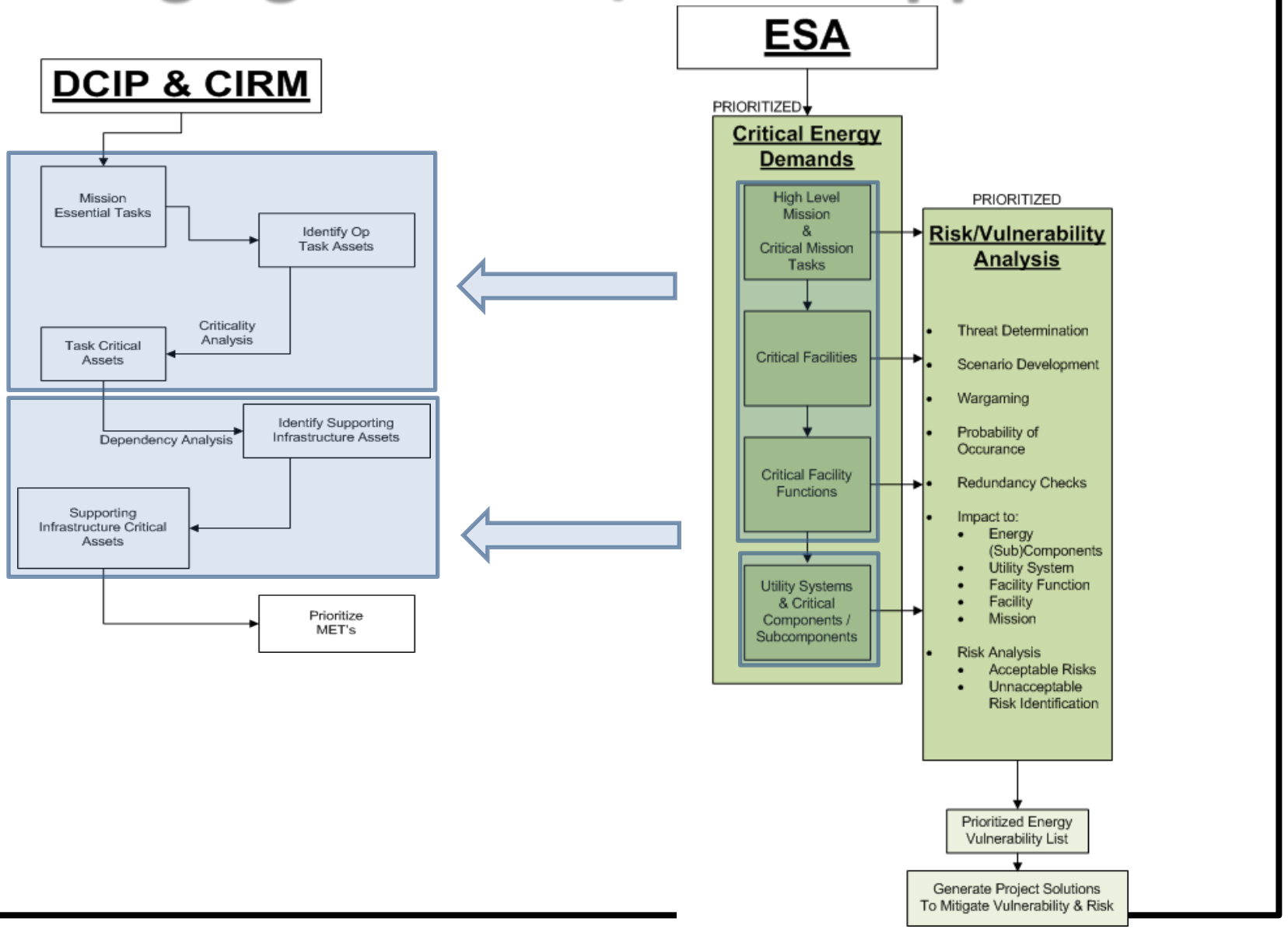
Leveraging the DCIP/CIRM Approach



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Thank You!!

Questions??

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