Utilizing NASA TEERM Project Development Methodology to Address NASA's Critical Infrastructure Resilience Needs

Jahn Dussich – ITB, Inc.

NASA Technology Evaluation for Environmental Risk Mitigation (TEERM)

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TEERM Technology Evaluation for Environmental Risk Mitigation

- Experience in evaluating technologies to reduce NASA mission risks.
- ITB develops projects from proof of concept to execution readiness.
- TEERM's methodology emphasizes multi-partner collaboration, consensus, & consideration of emerging technologies.
- Expanding scope of risks addressed to include risks to critical infrastructure.






Representative Program/Project Partners, & other Resources...

- Center for Pollution Prevention Program C3P
- Rockwell Collins
- European Space Agency (ESA)
- Luso-American Foundation (FLAD)
- NASA Corrosion Technology Laboratory
- US Navy Air Systems Command - NAVAIR
- National Renewable Energy Laboratory - NREL
- Presidential Executive Orders
- Lockheed Martin
- NASA Principal Center for Regulatory Risk Analysis & Communication (RRAC)
- Air Force Space Command
- University of Dayton Research Institute
- SERDP ESTCP
- KTH University

Public & private partnerships are essential!

TEERM Project Methodology

- TEERM seven step approach ensures project address a real risk, has a business case & involved stakeholders
- ITB screens technologies & develops the project plan, which may call for testing, demonstration & hardware design/fabrication

- **Phase I**
  Identification
- **Phase II**
  Technical
- **Phase III**
  Business
- **Phase IV**
  Alternative Demonstration & Validation
- **Phase V**
  Process Change Authorization
- **Phase VI**
  Implementation
- **Phase VII**
  Evaluation/Feedback

Critical Infrastructure Risks

- Infrastructure risks to NASA's mission include threats to long-term viability & flexibility of critical facilities, operations, assets or systems.
- Risks to critical infrastructure include threats to water, energy, communications & transportation. Impacts are exacerbated by lack of resiliency or redundancy.
- TEERM identifies specific risks to NASA critical infrastructure & developing projects that evaluate that can mitigate these risks.
- TEERM collaborative & structured approach can be applied to these risks.

So how can the TEERM approach be applied to NASA critical infrastructure risks?

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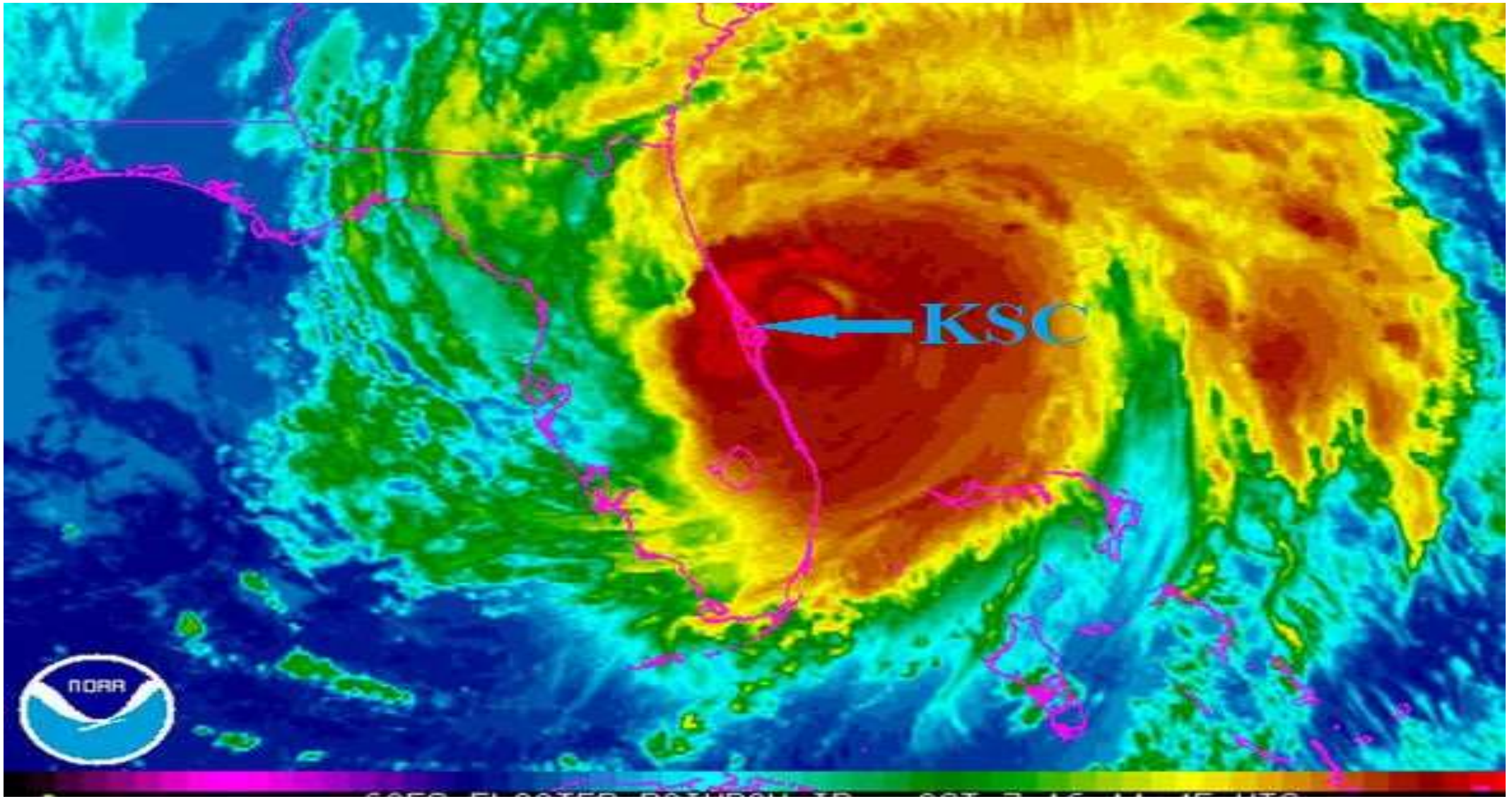
Oct 6th & 7th ..... Real world, recent example...



Hurricane Matthew Oct 6th & 7th ..... Real world, recent example...

Representative NASA resilience opportunities...

- Dual-Purpose, or “Good Day/ Bad Day” technologies

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Sustainability on a “good day”...

Resiliency on a “bad day”...

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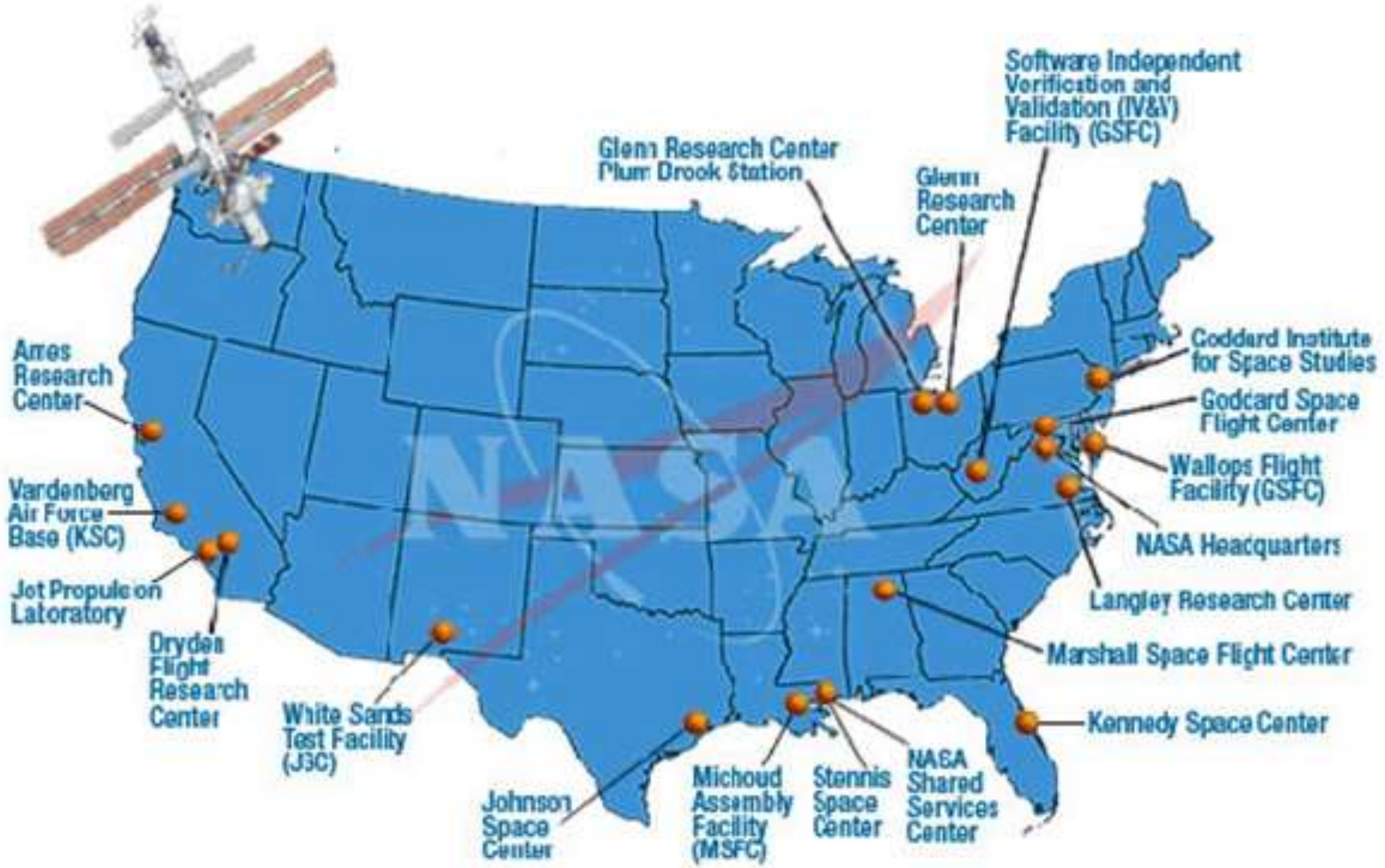
NASA Centers Resiliency Enhancement



Perimeter Security Checkpoint Enhancement Opportunity

Example: Moody AFB checkpoint with a canopy

Example: Eielson AFB checkpoint with a roof

Proposed project location: KSC South Gate access

Proposed project location: KSC West Gate access

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Perimeter Security Checkpoint Enhancement Opportunity

NASA Need & Mission/Program Impact:

DoHS Facilities Design Guide & requirements (i.e.: NASA NPR 1600, NPD 8820, PPD-21, etc.), call for identification, prioritization, & evaluation of critical infrastructure or key resources for vulnerabilities, & the funding of appropriate security enhancements necessary to mitigate identified vulnerabilities. NASA's Protective Services are often the 1st line of defense to NASA's critical facilities, & the implementation of a canopy/technology demonstration platform implementing both resiliency & security technologies enhances this protection & addresses requirements.

Stakeholders:

NASA: (KSC, JSC, MPC, MSFC, WFF), DoE, LunaPlast Inc., SunLink, Siemens, US Applied Physics Group (US APG), Path Sensors, ProHawk Technologies

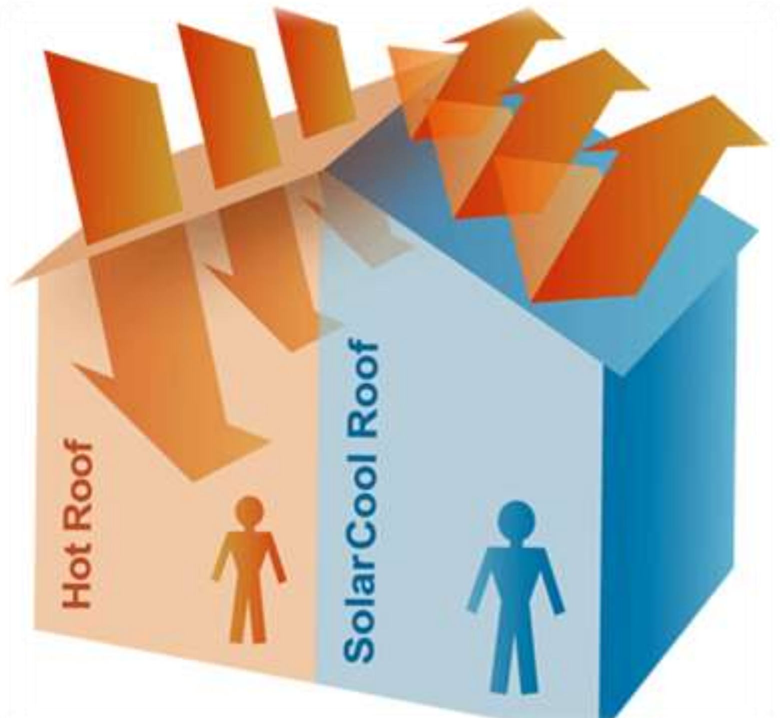
Technical/Business:

TEERM is considering NASA Protective Services requirements as well as applicable technologies, design characteristics. Using USAF CCAFS Main Gate Security Forces Protective Enclosure as an approved local guide, while optimizing potential enhancements.

Alternative Demonstration/Implementation:

TEERM is working with stakeholders to get buy-in & goal would be implementation of resiliency-enhancing technologies.

Perimeter Security Checkpoint Enhancement Opportunity



Credit: millenniumcommercialroofing.com/commercial-roofing/cool-roofs/

Credit: http://www.intematix.com/products/l&ing-pages/high-bay

Credit: www.rbbelectrical.co.uk/case-studies.php

Credit: cleantechnica.com/2011/06/28/hybrid-wind-solar-power-generators-for-homes-businesses/

Perimeter Security Checkpoint Enhancement Opportunity

Credit: http://spinoff.nasa.gov/spinoff2003/ps_3.html


Credit: https://www.bruker.com/products/cbrne-detection/ft-ir/rapidplus-rapidplus-control-20-vom/overview.html

Thank you!

감사합니다!

Merci!

Questions?

Obrigado!

¡Gracias!

Danke!

Tack!

ありがとうございました！

Grazie!

Jahn Dussich
jahn.m.dussich@nasa.gov
321 867 3836

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