Building Resilient Foundations and Frameworks Infrastructure and Individual

Presented to:
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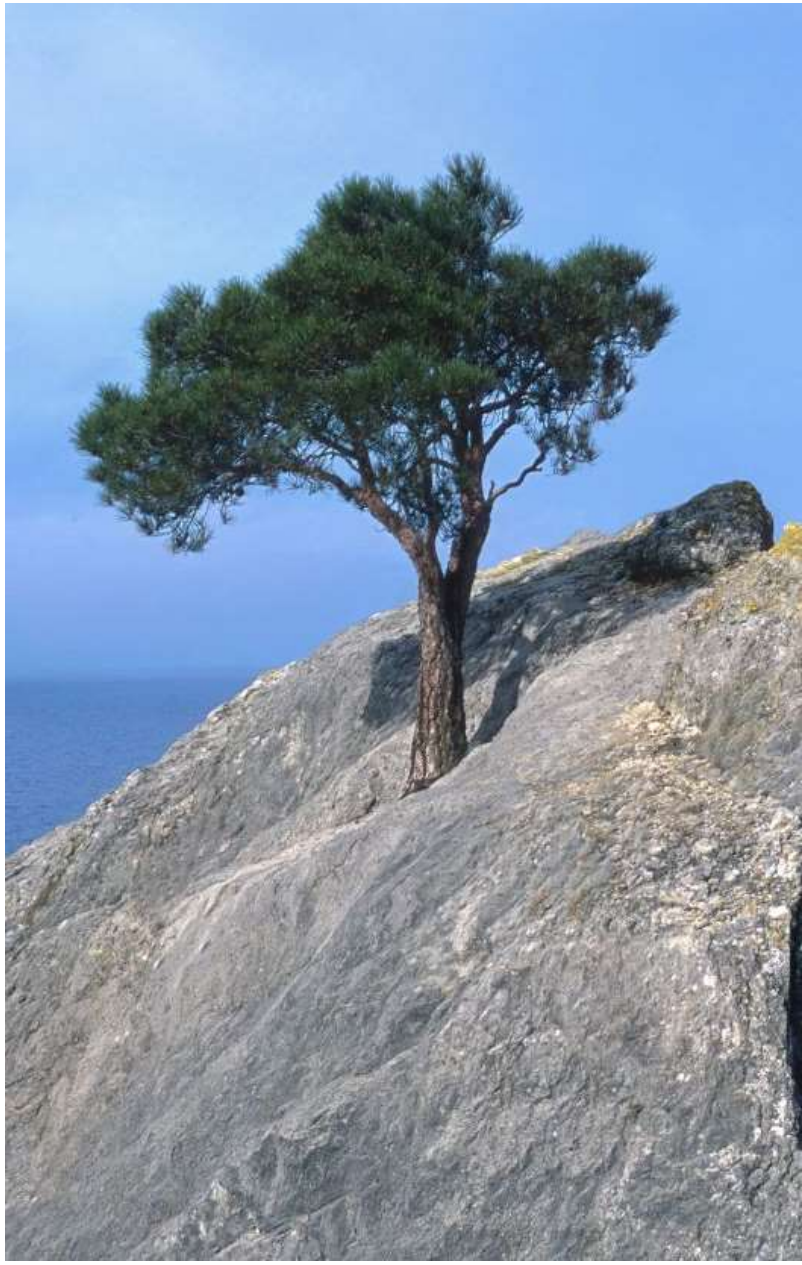
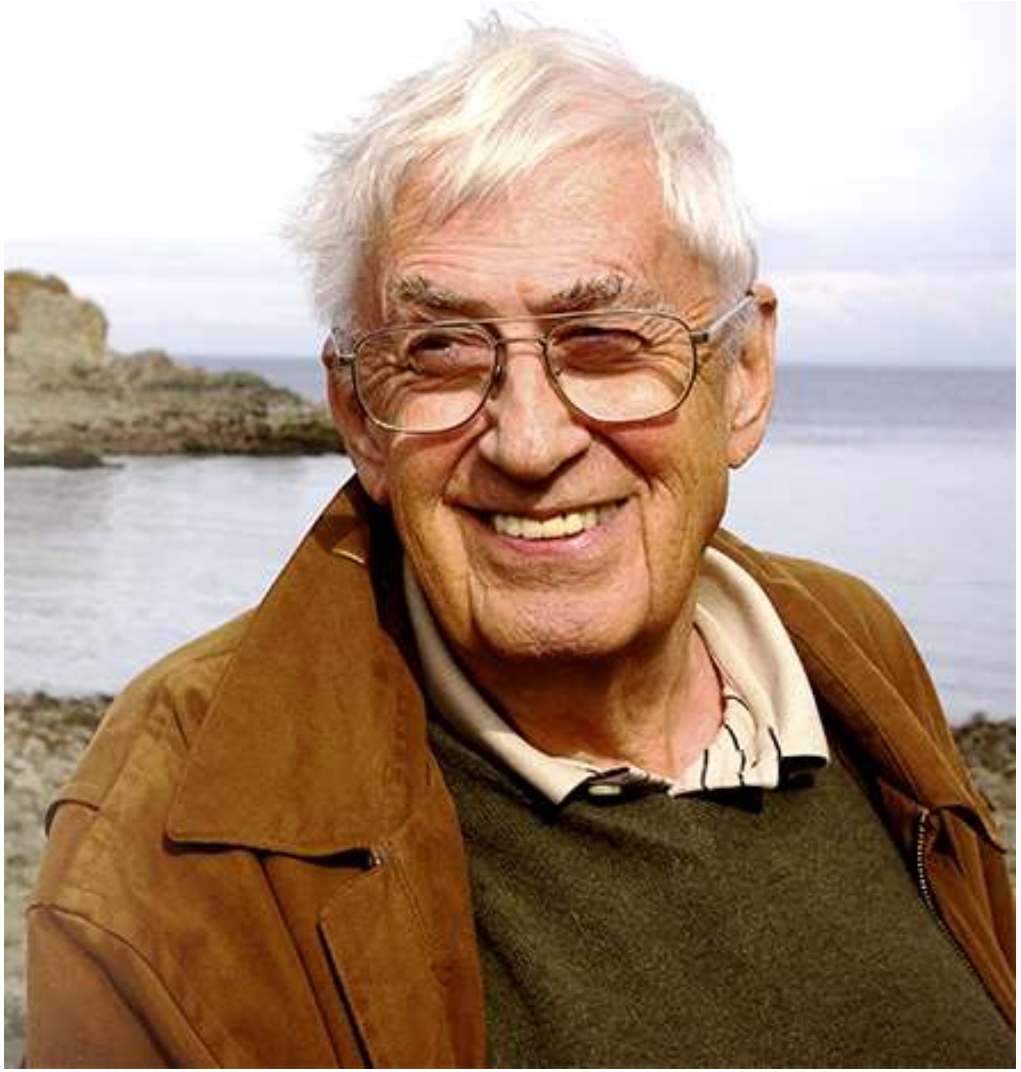


Resilience Agenda

- Self-evaluation: Word Cloud; Rating
- Definitions and Core Similarities
- Comparing Mission, Infrastructure, Asset and Personal Resilience
- Adaptability, Adaptive Capacity, and Risk Management Strategies
- Resilience Initiatives and Key Take Aways
- Resilience Improvement Exercise

What word would you use to describe resiliency?

Rate your Personal resilience



What is Resilience?

RESILIENCE

“Resilience is the capacity of an ecosystem to respond to a perturbation (shock) or disturbance by resisting damage and recovering quickly.”

“Such perturbations and disturbances can include stochastic (random process) events such as fires, flooding, windstorms…”

(C.S. Holling 1973)

Shared Understanding of Terms and Definitions!

- **Resilience** - The ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions. (DoDD 4715.21)
- **Hazard** - A condition with the potential to cause injury, illness, or death of personnel; damage to or loss of equipment or property; or mission degradation. (DoD Dictionary, 2021)
- **Risk** – Probability and severity of loss linked to threats or hazards and vulnerabilities. (DoDD 3020.40)

What is Resilience?

- The capacity to recover from difficulties and adapt to change.
- Systems that withstand disruptions and continue functioning.
- Coping strategies that help individuals manage stress and challenges.

Why is it important?

- Crucial for maintaining functionality in both physical and emotional contexts.
- By learning from one another, we can develop stronger systems and individuals.

In the Human Context Resilience Is:

"the ability to **withstand** (work through in the moment), **recover** (to gain an adaptive perspective), and **grow** (to learn from and generalize to other situations) in the face of stressors."

(Lt Col Jill Silverman, MD, CAP)

See DoD Definitions in DoDD 4715.21, 3020.40, and DoD Dictionary, 2021

Core Similarities in Meanings

Adaptability

Infrastructure systems must adapt to external pressures.

Individuals develop flexibility to cope with unexpected challenges.

80% of people who develop resilience habits are better able to adapt to life changes and stress

Redundancy

Infrastructure relies on backup systems to maintain functionality.

Having multiple personal coping mechanisms, helps individuals navigate stress and adversity.

Infrastructure with redundant systems are **30% less likely** to experience extended outages

Anticipation & Preparedness

Infrastructure is designed with risks in mind, employing contingency plans for potential disruptions.

Individuals prepare for stress with strategies to manage uncertainty.

FEMA reports that every **$1 invested in disaster preparedness** saves **$6 in post-disaster recovery costs**

Mission Critical Assets – Getting to Adaptive Capacity

Sensitivity and Adaptive Capacity derive from Asset and Facility: **Age, Location, Condition, Structural Characteristics, Life-Cycle Status, Accessibility, Interdependence, Redundancy, Robustness, Resources, Single Points of Failure**

Exposure to Natural Hazards (Causes)

- Severe Wind (Hurricane, Tornado)
- Water Stress
- Heat Stress
- Flood (Coastal, Riverine, Pluvial)
- Tsunami
- Earthquake
- Landslide
- Wildfire
- Volcano

Exposure
Low to High

Sensitivity
High or Low

Impacts (Effects/Consequences)

- Missions
- People
- Infrastructure
- Assets
- Supply Chains

Adaptive Capacity
(High or Low)
Meeting Mission-Objectives:
Effective or Ineffective

- Ability to adapt to impacts
- Capture opportunities
- Manage consequences

Quality of Capability to Anticipate, Detect, Protect, Prepare, Adjust, Respond, Recover

Key Resilience Terms Related to the Mission and Natural Hazards

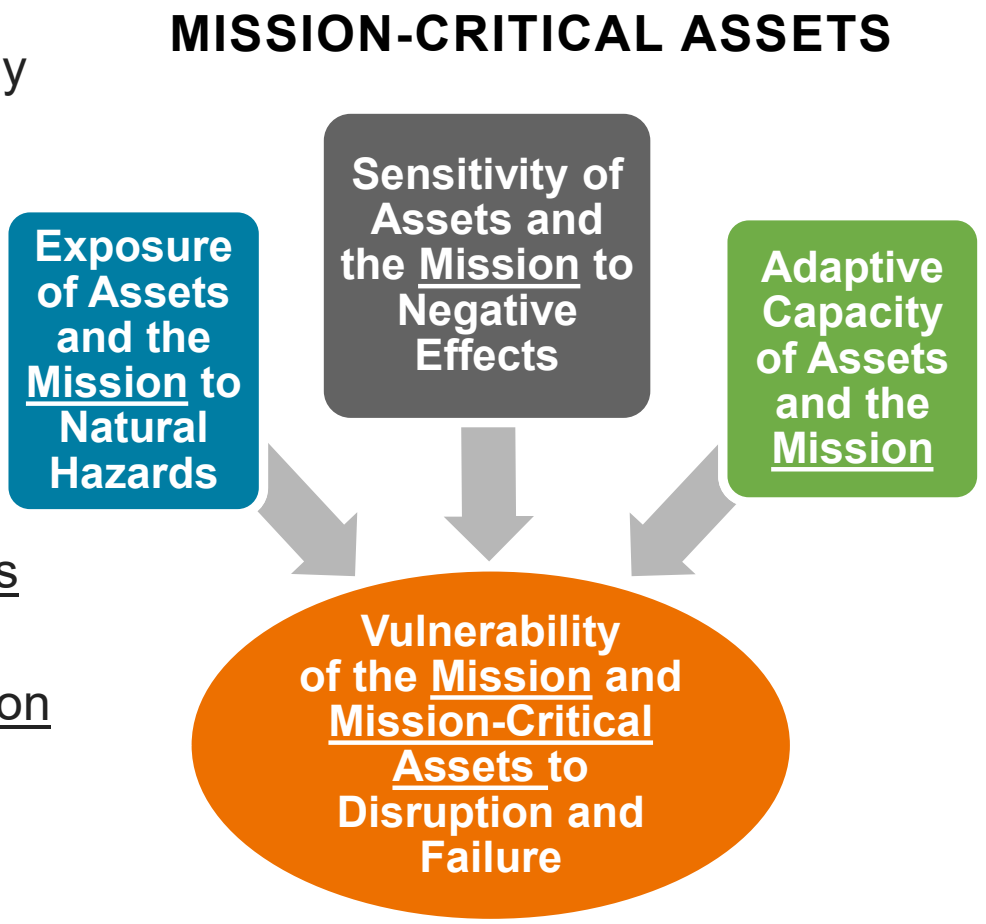
Exposure: state of people, other assets, or Mission being exposed to contact with Natural Hazards

Sensitivity: Degree natural hazards can negatively affect an asset, infrastructure, installation, and Mission

Adaptive Capacity: ability to adjust assets or Missions to counter negative affects of natural hazards, capture opportunities, and manage consequences

Vulnerability: degree characteristics, condition, attributes make people, other assets, and Missions subject to harm from natural and human hazards

Mission-Critical Asset: an asset that - if its function is disrupted or it fails - can have severe negative effects on Mission objectives



Adaptability in Action

Infrastructure Adaptability

- Elevating roads and flood barriers to combat rising sea levels.
- Investing in Nature-based solutions, i.e., “green infrastructure”, including parks and green roofs that absorb stormwater.
- Designing drainage systems to better handle increased heavy rainfall.
- *Cities with adaptive infrastructure have reduced natural hazard economic damages by up to 90%*

Personal Resilience Adaptability

- Individuals who lost jobs during the pandemic sought new skills through online courses and certifications.
- People pivoted to freelance work when traditional jobs were unavailable.
- Adaptability after job loss: A Harvard Business Review study found that people who re-skill or change careers in response to economic disruptions experience a 40% increase in long-term job stability

Redundancy & Backup Plans

Infrastructure Redundancy

- Power grids often integrate multiple energy sources like solar, wind, and gas to ensure reliability.
- This diversification helps maintain electricity supply during outages or peak demand.
- Smart grids utilize technology to reroute power automatically in case of failures.

Power grid redundancy: Countries with redundant power sources, experience **99.9% power reliability**, while countries with single-source grids have **double the rate of power outages**

Financial resilience: A study found that **families with emergency savings** of 3–6 months' worth of expenses are **60% more likely** to maintain financial stability during a crisis than those without savings

Personal Resilience Redundancy

- People can build diverse support networks, including family, friends, and professional mentors.
- Having multiple coping strategies, like exercise, hobbies, and therapy, helps manage stress.
- Creating financial safety nets, like emergency funds, ensures stability during unexpected events.

Anticipation & Risk Management

Infrastructure Examples of Anticipation

- Buildings are designed with flexible structures to absorb seismic energy during earthquakes.
- Retrofitting older occupied buildings to meet current earthquake standards enhances safety.
- Smart city technologies monitor infrastructure health, allowing for proactive maintenance.

In Japan, **strict building codes and earthquake-proof design** have led to a **90% reduction in fatalities** from earthquakes compared to countries with less strict regulations

Emotional preparedness: People who practice mindfulness or mental health exercises regularly show a **25% lower risk of developing anxiety disorders** during major life events

Examples of Emotional Preparedness

- Therapy provides tools to cope with unexpected life challenges and stress.
- Mindfulness and meditation practices enhance emotional regulation and resilience.
- Personal crisis plans with support networks ensures readiness for tough times.

“Construct for Resilience Originally Conceived by Resilience Expert Dr. Stephen Flynn”
National Infrastructure Advisory Council

Exhibit 2.1 The Sequence of the NIAC Resilience Construct

https://www.dhs.gov/xlibrary/assets/niac/niac-a-framework-for-establishing-critical-infrastructure-resilience-goals-2010-10-19.pdf

The US Air Force 5 Rs Doctrine for Resilience

ROBUSTNESS: Extent to which a system can absorb an impact or prevent the impact from spreading to other parts of the system.

REDUNDANCY: Extent to which a system has a diversity of methods in which it can continue to provide the required level of service.

RESOURCEFULNESS: Extent to which a system can adapt when impacted during a risk event and the speed with which it adapts.

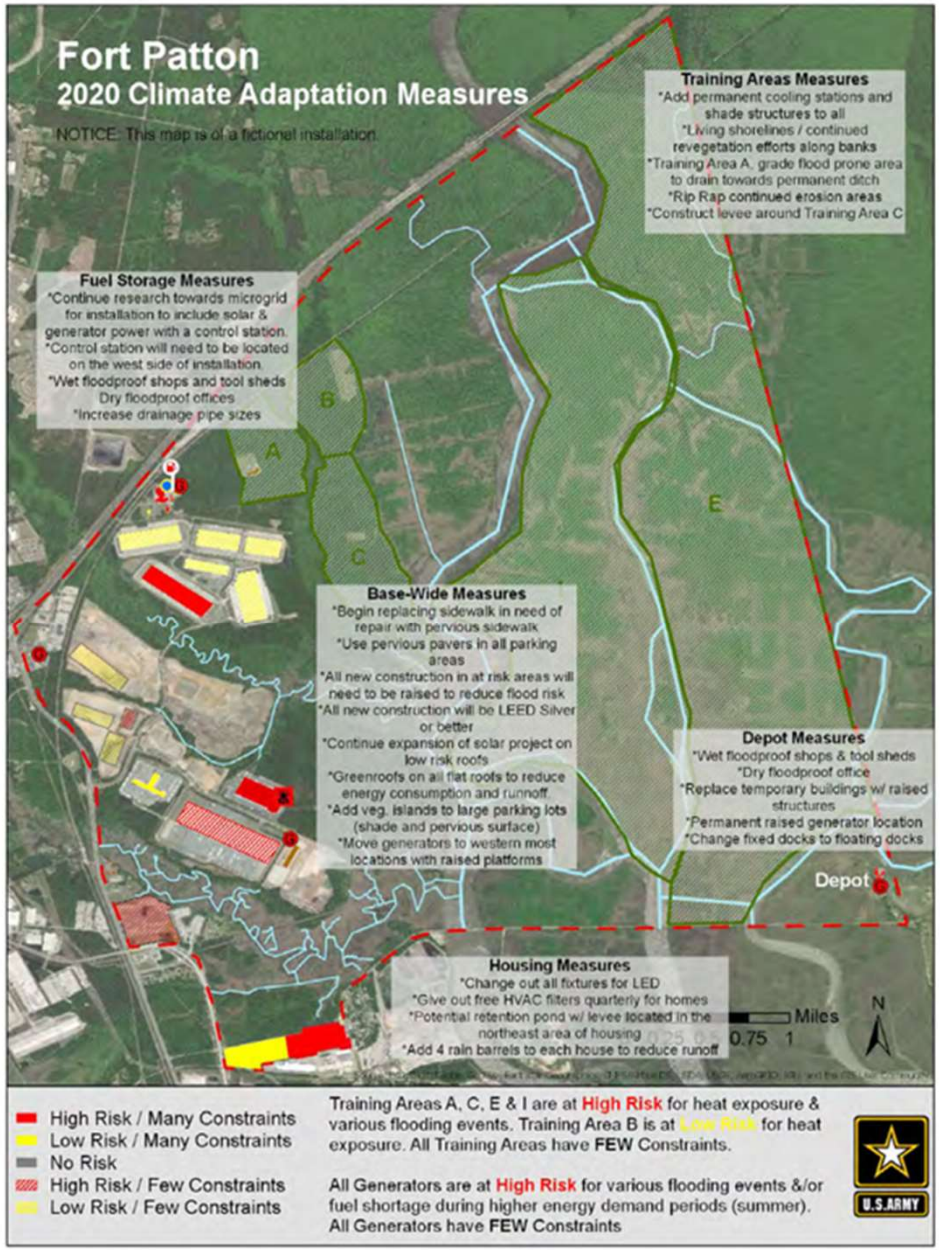
RESPONSE: Extent to which a system can enable installation activities to return to mission effectiveness.

RECOVERY: Extent to which a system can regain initial mission effectiveness as well as normal operations plus the ability to provide support to the surrounding community and region.

[Tyndall AFB | Performance Standards | Introduction (tyndallifs.com)]

Notional Resilience Example from the Army Handbook

- Asset Categories and “Measures” (Actions)
- Risk Levels
- Exposures
- Sensitivities
- Adaptive Capacity



Lessons from Both: Strategies for Building Resilience

Infrastructure Resilience Strategies

- **Invest** in robust an redundant systems to withstand disruptions and reduce vulnerabilities.
- **Regularly update** technology and infrastructure to incorporate the latest advancements.
- **Engage** in community and regional (outside the “fenceline”) planning, collaboration and coordination to enhance overall resilience.

Plus tip:
Avoid seeing crises as **insurmountable**

Personal Resilience Strategies

- **Nurture relationships.** Have a range of positive, supportive connections within and outside your family. Build strong support networks of friends, family, and colleagues.
- **Find meaning in difficulties**. When faced with adversity, try to discover some positive way in which you’ve dealt with the challenge.
- **Accept change as part of living**. Expect things to change and adversity to occur, rather than pretend all will always be well. Adopt lifelong learning habits to develop new skills and adapt to change.

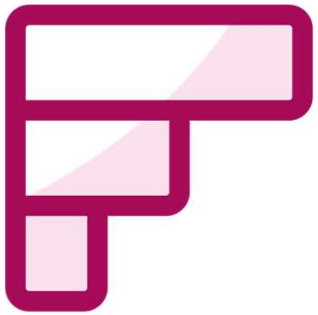
Plus tip:
Having multiple coping mechanisms (e.g., social support, financial backup) **reduces** the risk of chronic stress by **50%**

Key Points for Successful Resilience Improvement Initiatives

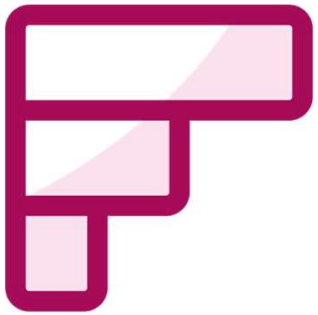
- Organize a cross-functional team with people from throughout the organization, including top command!
- Conduct a “baseline” assessment and have planned, measurable improvement objectives.
- Support mission protection and mission-critical assets
- Require systematic risk-based analysis and prioritization.
- Include adaptation and management practices, process improvements, and tangible, defined, measurable results.
- Consider Exposure, Sensitivity, Adaptive Capacity and Vulnerability of the people, installation, infrastructure, property assets, and the Mission!

Key Take-Aways

- Resilience is holistic, as it encompasses mission, assets and personal situations and circumstances.
- By understanding resilience in various contexts, we can better equip our organizationas and ourselves to face challenges.
- This holistic view of resilience allows us to draw on valuable lessons that enhance our ability to prepare, respond, adapt, recover, and thrive in our lives, our families, our organizations, and our Missions!



Choose the range that matches the sum total of your team's resilience.



Choose the range that matches the sum total of your personal resilience.

Thank You!

- **Resilience Improvement Identification Exercise**
- **Questions/Discussion/Conversation**

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