

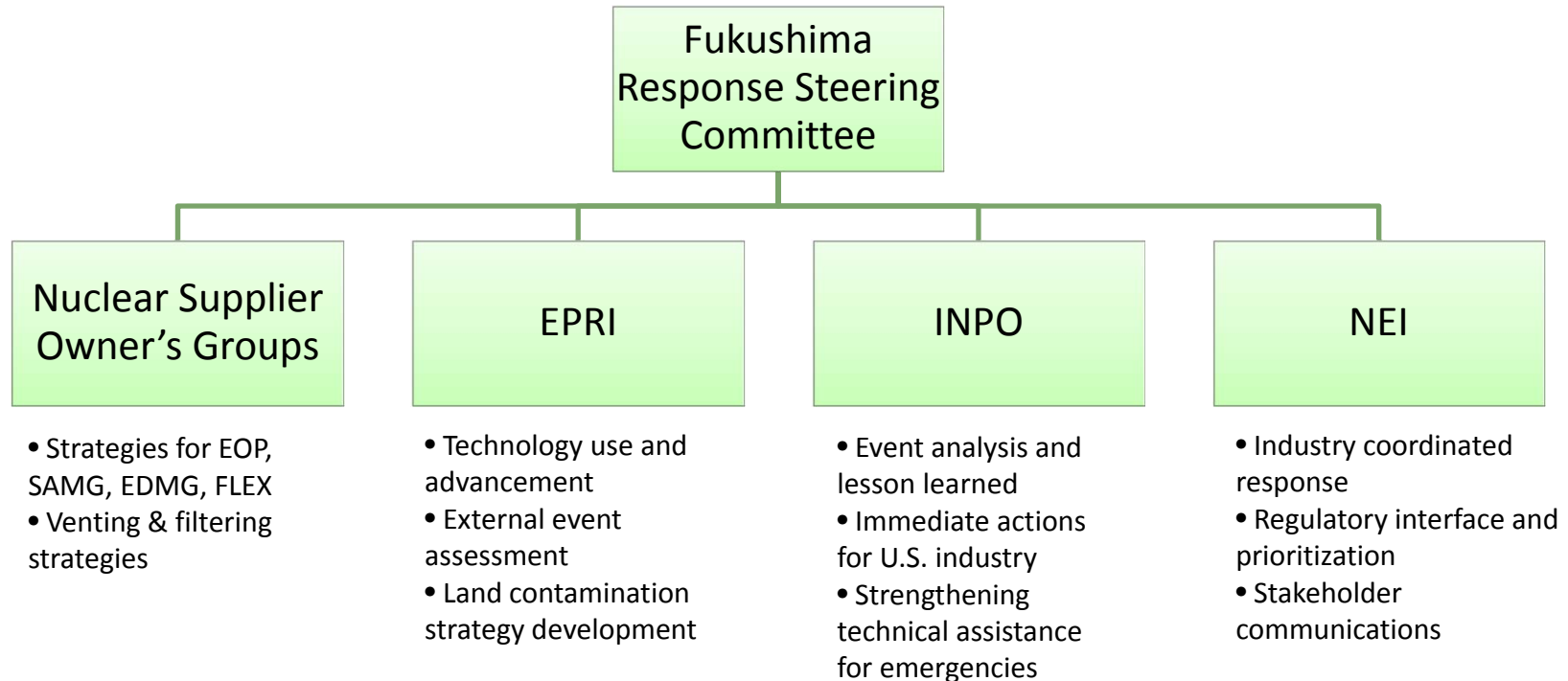
Nuclear Generation Event Response: *Strengthening Safety After Fukushima*



Steven P. Kraft
Senior Technical Advisor
Nuclear Energy Institute

Industry Response Coordination

The Way Forward



» Assist/Facts/Root Cause/Lessons Learned/Timely Response

Safe Even During Extreme Events



- ▶ April 28, 2011— Safety maintained at Browns Ferry during tornados that knocked out offsite power and damaged 200 transmission towers

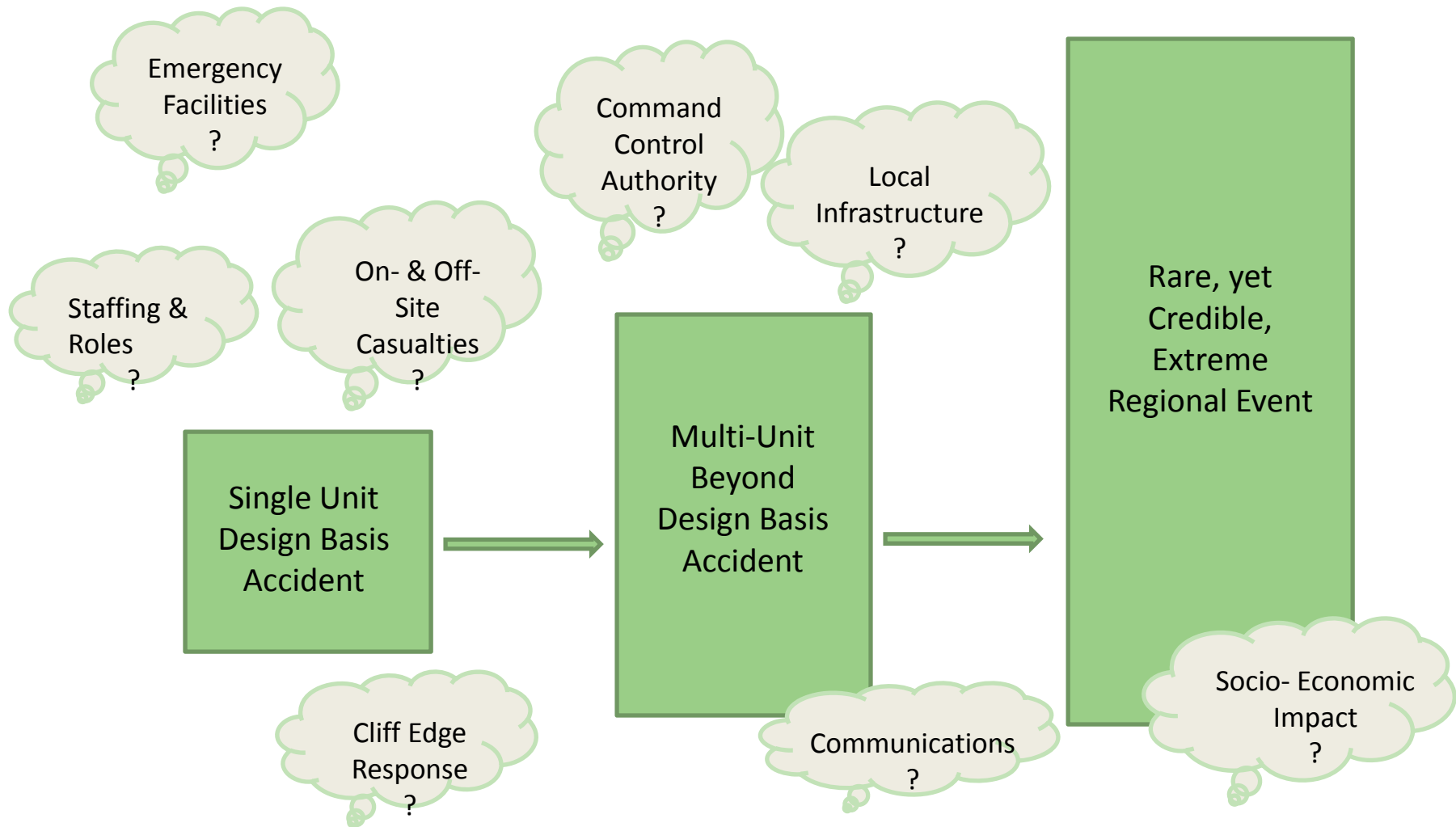


- ▶ June 26, 2011 — Safety maintained at Ft. Calhoun historical Missouri River flooding

- ▶ August 23, 2011 — Safety maintained at North Anna during strongest earthquake on record



Changing Perspectives After Fukushima



U.S. Nuclear Industry Response

- Confirm safety of U.S. reactors
 - Verify operability and usability of portable mitigation equipment (B.5.b) already on site
- Establish factual basis for action based on understanding of the events in Japan
- Performed in-depth examination of accident mitigation with no AC power
- Calculated time to used fuel pool boiling
- Implemented stronger fuel pool equipment protections
- Performing Review Visits at Sites

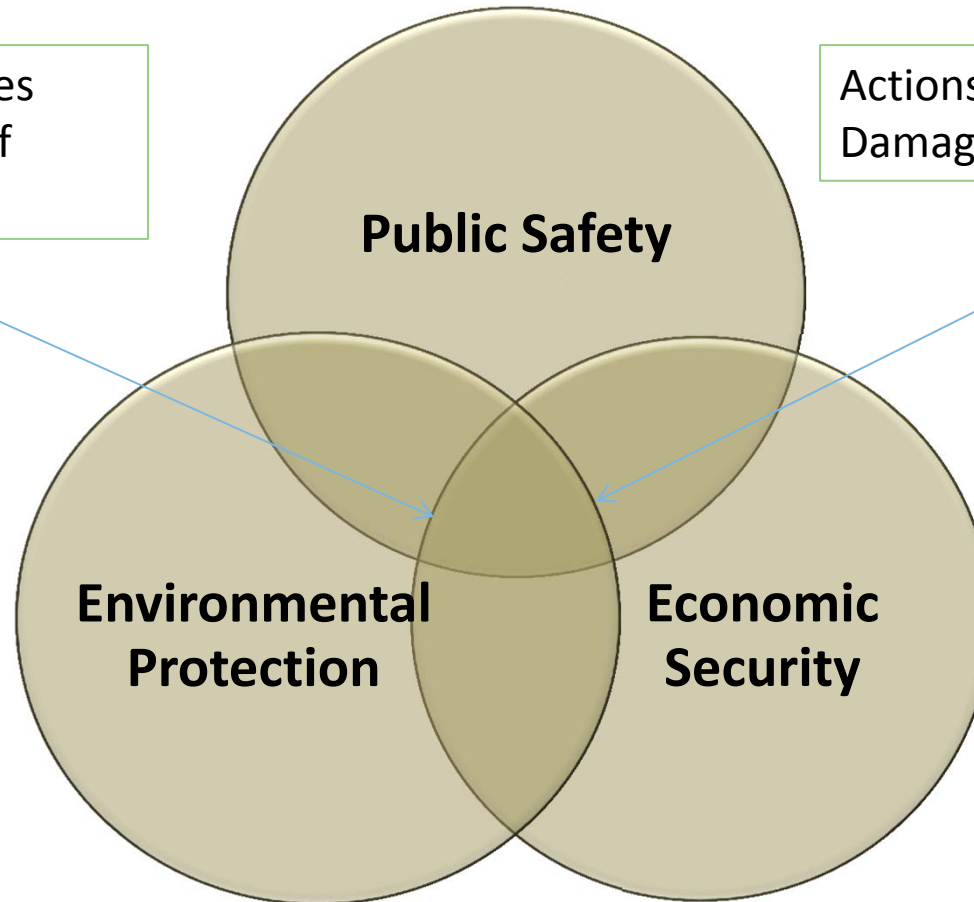
U.S. NRC Actions

- NRC actions are broken into 3 tiers
 - Tier 1: without unnecessary delay
 - Completed by 2016
 - Tier 2: require critical skill sets or further technical assessment
 - SFP recommendations moved into extended loss of AC power rulemaking
 - Tier 3: require further long-term study/ scoping
 - Under evaluation

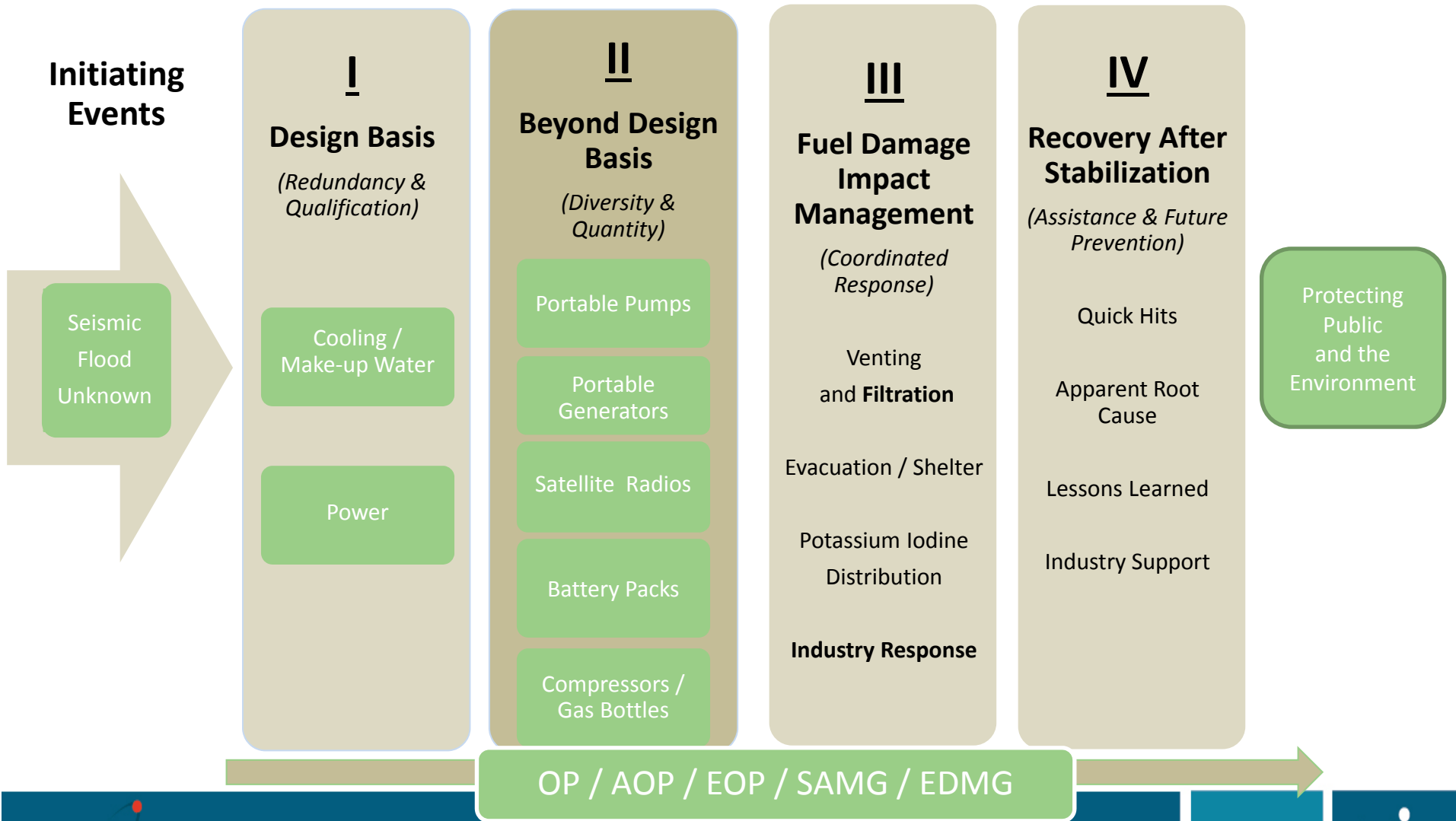
The Future of Nuclear Energy Requires Actions at the Convergence of Goals

The Industry Promotes Actions in the Area of Overlap

Actions to Prevent Core Damage Fulfill All Goals



Safety Assurance for Unpredicted Events



Why FLEX?

- Diverse backup safety measures are the key to maintaining safety functions following an extreme event
- Adding safety margin to current design may fall short or be misdirected in preparation for the unknown
- Portable equipment is the foundation of security strategies and eventually mitigated the event at Fukushima
- Provides flexibility for the ERO to respond to unpredicted impacts



U.S. Industry Post-Fukushima Actions

Plus Regional Centers and Industry Response Capability



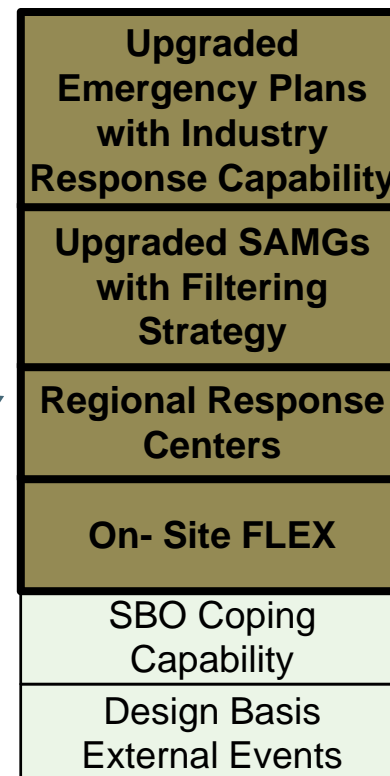
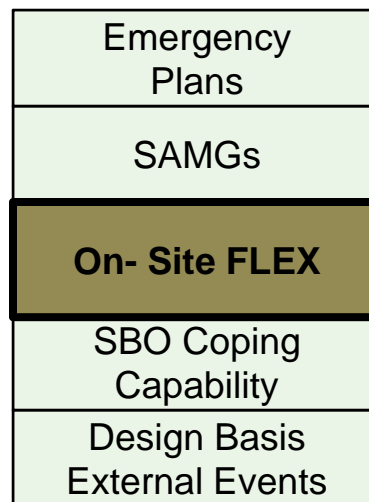
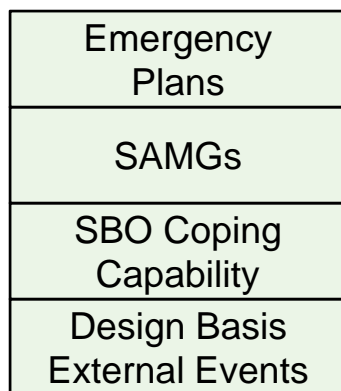
Plus On-Site FLEX

Current

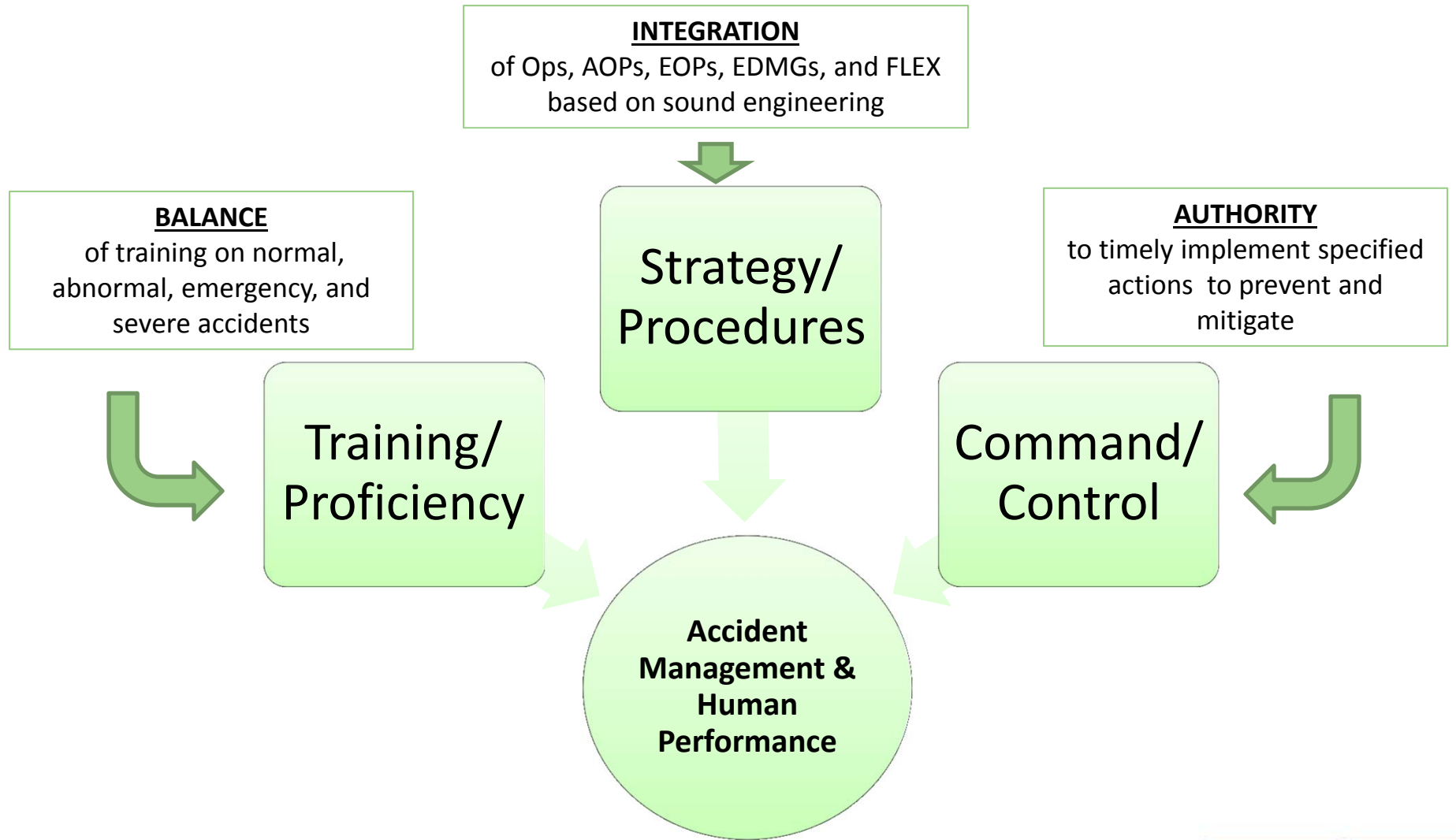
Emergency Response

Mitigation

Protection



Proper Balance, Integration and Authority



U.S. Industry's Major Accomplishments

- ✓ B.5.b equipment readiness affirmed by inspection and test
- ✓ Initial inspections completed for flooding and seismic vulnerabilities
- ✓ Station blackout procedures and equipment readiness validated
- ✓ Periodic maintenance and drills verified to exist or established for B.5.b equipment
- ✓ NRC endorsed the FLEX strategy
- ✓ Spent fuel pool monitoring enhanced

U.S. Industry's Major Accomplishments

- ✓ FLEX equipment specified, purchased, arriving at sites
- ✓ RRC (regional response centers) approved
- ✓ Event investigation with TEPCO completed
- ✓ Flooding guidance established, walk-downs completed
- ✓ Seismic guidance established, walk-downs completed
- ✓ Flooding hazards—scope and methodology approved

Major Work in Progress

- Seismic hazards—working on alternate methodologies
- Developing site-specific FLEX strategies
- Developing integration of EOPs, SAMGs, EDMGs and FLEX
- Reliable spent fuel pool wide-range level instrumentation in design
- Land contamination / containment pressure / H2 control
- Regional Response Center / Industry Infrastructure

Industry Coordination & Sharing

- Established Regional Response Centers to provide additional equipment and resources from outside of the utility involved in the event
- Expanded current sharing practices between utilities to include emergency equipment
- Expand current parts database to include emergency equipment
- INPO improved Emergency Response Center to coordinate industry response and support

Safety Culture

- Leaders understand the potential for cliff edge impact of new information
- Leaders set the expectations of technical rigor and timely disposition of new information
- Leaders own the emergency preparation for rare but extreme events
- Leaders value the importance of independent oversight for nuclear operation
- Leaders ensure the business structure promotes the continuous improvement of safety

Industry & Regulator Interface

- Share a common mission in protecting public health and safety
- Industry has first and primary responsibility for safety
- Regulator must be independent but not isolated from the industry knowledge base
- Industry must value and enable the regulatory oversight by complete transparency
- Open public meetings engaging input from all stakeholders strengthens nuclear safety
- A strong competent regulator earns the respect of all stakeholders and is the responsibility of both the industry and the regulator

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