

Safe and Advanced Field Execution (SAFE)

INITIATIVE DESCRIPTION

A27, A29

- SAFE evaluates technologies that improve how utilities execute field work, establish temporary service, and restore customers under increasingly complex operating conditions. SAFE focuses on safely accelerating the energization of electric infrastructure, recognizing that electrification and resilience goals depend on safe field execution.
- Climate-driven hazards increasingly threaten reliable electric service; SAFE evaluates safer, more scalable, and more cost-effective approaches to maintaining service continuity, reducing outage impacts, and restoring customers during disruptive events.
- Maintaining reliable service during climate-driven disruptions requires rapid energization and restoration under challenging field conditions; SAFE evaluates field-execution and safety technologies to improve resilience, service continuity, and outage recovery.

PROPOSED INITIATIVE BUDGET	\$17,012,831
% OF TOTAL BUDGET (excl. admin & overhead)	25%
# OF RESEARCH TOPIC AREAS	4

ALIGNMENT SUMMARY

STRATEGIC OBJECTIVE ALIGNMENT

A29

“achieve more cost-effective operational practices and capital investments for grid hardening to maintain grid resilience and reliability to long-term climate impacts, with a focus on increasing affordability, reducing outage risk, and reducing social burdens of outages.”

SAFE aligns with SO 13 by evaluating technologies that support rapid energization, service continuity, and restoration during climate-driven disruptions. The initiative generates utility-scale evidence on approaches that could improve resilience, reduce outage impacts, and lower the societal burden of outages.

CPUC ALIGNMENT

A28-A30

- CPUC climate-adaptation efforts increasingly focus on reducing outage risk, improving resilience, and mitigating the societal impacts of outages, creating a need for evidence on technologies that can maintain service continuity and accelerate restoration during climate-driven disruptions.
- SAFE will provide utility-scale evidence on rapid energization, temporary-service capabilities, restoration performance, outage mitigation, and resilience value to inform future resilience planning, emergency-response programs, infrastructure investment, standards development, and rate-case decisions.
- Ratepayer-funded EPIC demonstrations are appropriate because restoration and resilience technologies must be validated under actual utility emergency conditions before utilities and regulators can make informed decisions regarding their deployment and potential resilience benefits.

Rapid Deployable Field Systems

13. Cost-Effective Grid Hardening
for Long-Term Climate Impacts

WHAT PROBLEM ARE WE SOLVING? A78

Climate-driven disruptions can result in prolonged outages when utilities lack rapidly deployable systems capable of maintaining or restoring electric service under degraded operating conditions. Existing emergency-response options can be slow to deploy, difficult to integrate with utility systems, and reliant on diesel-based generation, limiting utilities’ ability to reduce outage impacts and maintain service continuity. Rapid Deployable Field Systems addresses this gap by evaluating modular, low-emission technologies that could accelerate energization, support temporary service, and reduce customer impacts during climate-driven events.

Safe and Advanced Field Execution
(SAFE)

START	2027-2028
OUTPUTS	2029-2032
MARKET READY	2030-2035

ALIGNMENT SUMMARY

WHAT IS THE DISTINCT RESEARCH APPROACH?	HOW WILL YOU KNOW YOU ARE SUCCESSFUL?	HOW WILL YOU COORDINATE?
• Demonstrate modular mobile microgrids, rapid poles and towers, ground-level distribution systems, mobile command centers, and other rapidly deployable technologies capable of delivering temporary service during climate-driven disruptions. (A78) • Validate integration with DERMS, OMS, SCADA, communications systems, and emergency-response workflows to determine whether temporary-service technologies can operate as utility-integrated resilience assets rather than stand-alone emergency equipment. (A78) • Evaluate whether rapidly deployable systems can provide operational readiness within hours, maintain service under degraded conditions, and reduce reliance on diesel-based emergency response. (A78)	• Establish whether rapidly deployable systems can maintain service continuity, reduce outage duration, and accelerate restoration during disruptions. (A79, A80) • Validate the interoperability, reliability, and value of mobile energy systems operating under degraded communications and emergency conditions. (A78, A79) • Demonstrate a pathway for low-emission emergency energy systems to provide cost-effective resilience and critical-facility support during outages. (A80) • Primary Result: Validated rapid-deployment and temporary-service capabilities supporting climate resilience. (A78, A80) • Metrics: Outage duration avoided, deployment time to readiness, critical load maintained during outages. (A79)	• Build on prior EPIC and DOE work involving microgrids, mobile storage, DER integration, islanding, black start, and resilience. (A78-A79) • Advance prior work through a specific focus on mobility, speed, field operability, and lower-emission emergency response capabilities. (A79). • Coordinate with other EPIC Administrators and the CEC to align demonstrations and avoid duplication. (A79)