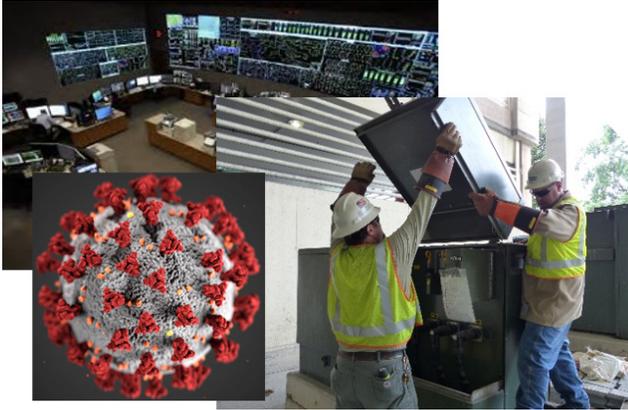


Pandemic-Resilient and Sustainable Transmission and Distribution (T&D) Systems



- Evaluate disinfectant processes, personal protective equipment (PPE), and health monitoring to enhance safe workspaces
- Evaluate work processes and facility designs to enable safe, reliable, and efficient operations
- Assess and prepare for future demand impacts and mitigate potential operating challenges.
- Understand sustainability implications to decarbonization and renewable energy targets

Meeting Critical Energy Needs at a Critical Time

The coronavirus (COVID-19) pandemic has underscored the role of electricity delivery as an essential service. Transmission and distribution (T&D) system companies have adapted existing tools and designs to reliably maintain control center and field operations, while enabling safe, healthy environments for staff and customers.

Throughout the pandemic, EPRI has driven global collaboration, engaging more than 2,200 staff from more than 300 companies through a T&D COVID-19 Impacts webcast series. Building on input from this collaboration and EPRI's pandemic-related research and analyses, this project aims to assess the near- and long-term impacts of COVID-19 and provide a rigorous technical basis for future pandemic-resilient and sustainable T&D operations. Key project focuses of this project include:

- Evaluating the efficacy of existing and new protocols and technologies and developing new or improved processes for health, safety, and disinfection for T&D applications
- Developing new processes and tools that enhance control center and field crew operations and asset management under normal and pandemic conditions
- Forecasting near-term electricity demand and deferred capital and maintenance work impacts, identifying potential operational reliability challenges, and specifying associated mitigation options
- Assessing the long-term economic impact on system demand and sustainability strategies including impact to generation capacity factors, emissions and pollution, and renewables deployment and curtailment

Delivering Benefits Through Global Experience

Rarely do electric utilities around the world simultaneously face the same critical challenge as they are with the COVID-19 pandemic. This provides a unique opportunity to collaboratively develop a scientifically informed foundation for new T&D operations processes and technology applications that enable safe, reliable, affordable, and sustainable delivery of electricity under pandemic and non-pandemic circumstances. Project participants are expected to receive the technical basis for evolving company-specific pandemic response plans and sustainability strategies to meet current and future needs.

Project Approach and Summary

This multi-year R&D effort comprises the work areas outlined below. *Please see the associated project scope of work for detailed task plans.* Generally, the project team for each research area will conduct structured evaluations of the efficacy of the technologies, processes, and tools and develop recommendations. Participating members will receive periodic updates on activities and results.

Health and Disinfection Methods and Technologies

- Efficacy of utility-related PPE for T&D applications
- Workforce health monitoring and contact tracing
- Evaluate workforce testing including antibody tests
- Evaluate light and electrostatic spray technologies for T&D applications (Note: Other EPRI efforts are evaluating light technology biological efficacy.)
- Metrics and processes to inform telework decisions

Control Center Design and Processes

- Changes to main and backup building designs
- Contact procedures, shift schedules, and sequestration

- Restoration and storm recovery methods
- Cyber-secure remote operation processes/technologies
- Task analysis to evaluate automation opportunities

Field Crew Equipment and Processes

- Communications and tracking technologies for separation
- Processes for shared tools and safety of sanitized equipment for energized field applications
- Tools to reduce need for working in close proximity
- Remote staging of crews and staggered shifts

Operator and Field Crew Training Methods

- Technologies and processes for on-the-job training without requiring proximity
- Methods to transform in-person training to online platform
- Training modules for distancing in unique T&D scenarios

Near-Term Demand and Operational Impacts

- Tools to forecast demand impacts across load classes and evaluate delivery reliability and capacity to support
- Extrapolation of demand impacts to other seasons
- Mitigation methods and tools for high voltage, reverse power flow, increased flexibility options

Deferred Outages and Resource Adequacy

- Identify risks of deferred capital and maintenance
- Estimate impact of altered demand and generation availability on resource adequacy

Asset Management Strategy

- Factors that lead to uncertainty in supply chain affecting stock and spares strategies
- Statistical approaches to determine optimal spares and where they should be located

Long-Term Demand and Sustainability

- Market and model-based economic and energy sector demand impact (electric, transport, building, industry)
- Generation capacity factors; emissions and pollution
- Impact on electrification, efficiency, and renewables deployment and curtailment
- Impact of telework on environmental footprint

Prioritization of specific technologies, processes, and tools and associated case study for each task will be determined with project funders.

The non-proprietary results of this work will be incorporated into EPRI's R&D programs and made available to the public for purchase or otherwise.

Deliverables

Specific task deliverables are listed in the associated scope of work. Generally, project deliverables will include:

- Task reports with evaluation results and recommendations
- Videos, podcasts, and training modules for certain tasks
- Algorithm and/or tools for certain tasks
- Webcasts—interim results and select topics
- Final technical reports

Price of Project

Pricing is tiered based on the higher of participant's annual distribution TWh or peak transmission MW metric:

- Tier 1: \$60,000 (\$20k/year over 3 calendar years)
- Tier 2: \$120,000 (\$40k/year over 3 calendar years)
- Tier 3: \$180,000 (\$60k/year over 3 calendar years)

Self-directed funds (SDF) or tailored collaborative (TC) funds may be used. Funding can be split over three calendar years. The project requires total funding of \$7,000,000 to complete all tasks. Given the time-critical nature, the project will commence with a minimum of \$2,000,000 of total funding, with participants prioritizing tasks to be initiated.

Project Status and Schedule

The project is expected to begin in Q3 2020 and last for approximately 30 months. Results from prioritized tasks will be delivered sooner, with some potentially available within six months of project launch.

Who Should Join

This project is appropriate for T&D utilities interested in a technical basis for the design and application of pandemic resilient control center and field crew operational strategies.

Contact Information

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