Spring 2024 Collaborative Supplemental Projects

INTRODUCTION

EPRI is pleased to present our Spring 2024 collaborative supplemental project offerings. Supplemental projects reflect emerging and specific research needs of EPRI members, and collaborative supplementals encourage broad cooperation and collaboration among members at early project stages, amplifying the value of the research.

Collaborative projects are an important component of EPRI offerings and support enhanced and efficient technology transfer among those who participate. EPRI's Spring 2024 slate of supplementals covers research across our Energy Delivery and Customer Solutions, Generation and Nuclear sectors.

If you have questions about a supplemental topic or a need not available below, please contact your EPRI account team.

PROJECT TITLE (BY SECTOR)	DESCRIPTION
DISTRIBUTION	
Assessment of Anthraquinone (AQ) Wood Pole Treatment	Investigate how to successfully treat wood poles with AQ, then perform an environmental and engineering assessment.
Conductor Burndowns and Wildfire Mitigation When Using Compact Single-Phase Reclosers	Understand the impacts of using single-phase reclosers (such as the S&C TripSaver and Siemens Fusesaver) on downstream taps and its implications for downed conductors and wildfire ignitions.
Control Center of the Future Roadmap – Distribution: Defining the Requirements to Meet the Needs of the Modern Decarbonized Distribution System	This project aims to develop and apply a standard framework with decision support to help utilities develop a roadmap and action plan to deploy advanced operational capabilities in the distribution control center.
Distribution Asset Inspection and Maintenance Maturity Assessment	Survey utilities to gather distribution inspection and maintenance program information and build a maturity model. Utilities could use the model to support I&M roadmapping efforts.

PROJECT TITLE (BY SECTOR)	DESCRIPTION
DISTRIBUTION (continued)	
The Distribution Forum	This project establishes a confidential environment for distribution utilities where they can share issues, concerns, experiences, and lessons learned with the objective of helping each other hone their practices and achieve operational excellence.
Distribution Sensor Life-Cycle Testing	Laboratory testing and teardowns of distribution sensor systems to inform specification, selection, and maintenance decisions.
Distribution Solid-State Transformers: Applications and Laboratory Evaluation	The development of laboratory testing to understand the applications and potential challenges associated with solid state power electronic devices.
Evaluation of Automated GIS Data Cleanup Methods	This project is focused on evaluating technologies to automatically improve GIS data quality for distribution assets.
Evolving DER Interconnection Practices, Processes, and Standards	This project aims to help utilities improve DER interconnection practices and support utilities in application of DER interconnection standards.
Measurement Data Cleaning and Utilization	This project aims to evaluate large quantities of SCADA/AMI measurement data across a wide range of customer classes and feeders to understand the behavior of the measurements and identifying issues that affect the quality of measurement data.
Sensing to Detect Faults and Downed Conductors on Ungrounded Delta Systems	Evaluate different sensing solutions that can detect faults on ungrounded delta circuits and test different field scenarios and conditions in a lab environment.
Utility Integration with DER Aggregators	This project is focused on addressing utility-to-aggregator interactions related to provision of bulk system and distribution services.
ELECTRIFICATION & SUSTAINABLE ENERGY SYSTEMS	
Building Performance Standards: Evaluating Regional and Utility-Scale Impacts of Emerging BPSs	Identify cost-effective pathways for commercial and multifamily customers to comply with emerging Building Performance Standards (BPSs) in a utility's region or service territory.
Customer Willingness to Pay for Decarbonization, Electrification, Reliability, and Resilience	Use discrete-choice surveys that elicit customer preferences for alternative rate structures and enabling technology, and develop a simulation tool to estimate customer enrollment.
Demand Flexibility Tariff Design Framework: Guidelines for Data Centers and Other Large C&I Customers	Develop a framework to guide the design of demand flexibility tariffs for large C&I customers such as data centers, integrating cost recovery fundamentals with customer technologies and attributes for demand flexibility.
Ecosystem Risk and Resilience	Examine and address ecosystem health as it relates to the evolving generation mix and delivery footprint associated with decarbonization through four focus areas: Climate Impacts, Opportunities, and Environmental, Social and Governance (ESG) Disclosure; Quantifying the Value of Healthy Ecosystems for Communities; Infrastructure Siting Optimization; and Regional Ecosystem Priorities.

PROJECT TITLE (BY SECTOR)	DESCRIPTION
ELECTRIFICATION & SUSTAINABLE ENERGY SYSTEMS (continued)	
Ergonomically Enhanced Tool for Manhole and Vault Cover Removal: Phase II	Focuses on evaluating and refining the power hook tool for manhole/vault cover removal developed in a Phase 1.
Localized Residential Electrical Panel Survey	The goal of the Localized Residential Panel Survey project is to conduct individual state/utility electrical panel survey and modeling work in order to gain insight into how many homes in your specific territory or state may require an electrical service upgrade to accommodate whole home electrification.
Maritime Electrification Collaborative: Electric Workboat Technology Demonstration	Identify and demonstrate electric workboats for various use cases, and quantify the environmental benefits of electric propulsion systems.
Space Conditioning Load Discovery and Disaggregation for Electrification Planning and Analysis	Develop a disagg method and load shapes for heating/cooling end-use from AMI. While it focuses on HVAC, other large end-use detection work is possible with subsequent work (EVs, water heating, cooking).
Time-Varying Pricing Preference Simulation Model for Residential Customers	Quantitative analysis of customers' willingness to pay for various electrification and/or reliability services using utility-specific rates, pricing, and local prices for equipment and enabling technology.
Wildfire Smoke Health and Safety Hazards	Four workstreams aimed at reducing worker H&S impacts of wildfire smoke. Results are timed to provide results in advance of wildfire seasons.
GENERATION	
Enhanced Gas Turbine SCR Process Control	Improving the gas turbine SCR process control response time and emissions tracking by demonstrating in-situ integrated path NOx and NH_3 measurements between the ammonia injection grid and SCR catalyst.
Generation Safety Interest Group: Providing a Forum to Identify, Prioritize, and Advance Generation Safety R&D	Improving generation safety by exchanging insights and best practices, defining research and demonstration needs, and driving industry-level dialogue.
Hydrogen to Infinity: Developing a Hydrogen Gas Transmission Facility	Advancing low-carbon fuels by developing a hydrogen gas transmission testing facility at a PG&E site.
NextGen Geothermal Power (NGP) Pre-FEED Study	Examining the beneficial reuse of captured CO_2 through a pre-feasibility study on a ~10-MW U.S. demonstration plant.
Offshore Wind Supplemental Program: Cross-Cutting Solutions to Improve Accessibility and Value	Enhancing the accessibility and value of offshore wind power by developing cross-cutting solutions.
Security Design Architecture Review: Solar Inverters	Improving renewable energy reliability by assessing inverter security, communications protocols, reference architecture, and supply chain risk.
U.S. Center for Industrial Decarbonization and Energy Transition	Drawing on EPRI's and the World Economic Forum's global networks to identify and overcome barriers to industrial decarbonization.

PROJECT TITLE (BY SECTOR)	DESCRIPTION
INFORMATION, COMMUNICATIONS & CYBER SECURITY	
Creating Effective Analytics to Monitor Operation Technology (OT)	This project is focused on streamlining the process of creating operational cyber security norms for OT activity, optimizing alerts and developing visualization for faster incident response.
Data Management Collaborative: Surviving the Data Avalanche	This project is focused on data management strategies and frameworks to accelerate utility benefits of leveraging data from an increasing amount of sources.
Utility Red Team Collaborative	This project is focused on accelerating Utility Red Team knowledge sharing, technologies experience, industry trends and best practices for OT environments.
NUCLEAR	
Anticipating Climate Impacts to Nuclear Power Plants: Site-Specific Climate Hazard Information and Projections (CHIP) – Cohort 2	This collaborative yet customized EPRI project addresses the need of nuclear plants for credible site-specific projections based on the best available climate science and modeling for variables such as: air temperature, precipitation, snowfall, drought, streamflow, water levels, water temperature, hurricanes, and tornadoes.
Unmanned Mobile Technologies Collaboration Group	This project intends to foster adoption of unmanned robotic technologies by utilities across EPRI's Nuclear, ED&CS, and Generation sectors.
TRANSMISSION	
3D Scanning Technologies: Substation Applications	This project leverages the latest in commercial-off-the-shelf mobile mapping, reality capture, and 3D scanning technologies to test and evaluate their ability to support electric utility substation applications. Utilities that integrate these new tools may improve the asset life cycle process in the following ways: Substation Site Analysis and Planning, Substation Design, Substation Construction, Substation Maintenance and Repairs.
Computer-Assisted Circuit Breaker Work Order Categorization and Information Extraction	Enhance circuit breaker asset management by extracting valuable performance data from work order records.
Evaluation of Optical Fiber as an Overhead Transmission Line Monitoring Sensor: Full-Scale Laboratory Testing	A new technology in the industry utilizes overhead optical fiber.
FESTIV Power System and Market Simulation User's Group	This User Group provides a forum to help utilities through webcasts and training events with the application of FESTIV, an open-source steady-state power systems operation and market simulation tool that captures multiple scheduling horizons in power system operations.
Identifying At-Risk Overhead Transmission Spans for Exceeding Thermal Limits and Lightning Strikes: Improving Methods for Locating and Ranking Critical Spans	Project identifies spans that are most prone to exceed thermal limit for determining the appropriate location of DLR and AAR sensors and spans that are most prone lightning strike for determining the appropriate location of lightning mitigation tools.

PROJECT TITLE (BY SECTOR)	DESCRIPTION
TRANSMISSION (continued)	
Optical Ground Wire and Shield Wire Corrosion Due to Bird Mutes	Shield wire and OPGW are an important part of the overhead line system protecting the conductors from lightning and allowing communication (OPGW). These cables are usually resistant to atmospheric corrosion and made of materials such as galvanized steel, aluminum, aluminum alloys, aluminum-clad steel, and stainless steel. However, it has been observed that in high traffic avian corridors where vultures and other birds use shield wire as perches, bird excrement (or bird mutes) has led to the severe corrosion of shield wire and, in some instances, loss of communication in OPGW.
A Roadmap for Adoption of Future Inverter Technologies in Power Systems	This project intends to develop a targeted strategy that allows for the efficient adoption of future IBR technology. Future IBR technology can also include capability to provide blackstart and/or restoration services.
Scenario Development for Electric Company Integrated Resource Planning	This project seeks to extend the analysis of EIA Annual Energy Output and NREL Futures Studies to develop new planning scenarios not analyzed or explored by these other institutions, and that may be highly relevant for utility long-range planning.
SF6-Free Breaker Pilots	The research objective is to rapidly de-risk the application of a range of SF6-free breaker technologies through realistic pilot applications in EPRI's research substation.
Solar PV + Energy Storage Techno-Economic Analysis, Phase 2	This project aims to further the understanding of the cost and performance trade-offs of solar PV + energy storage plants as a function of storage discharge duration and system design.
Steel Core Conductor Corrosion Predictive Model Development	Many overhead transmission systems have been in service for over 40-years. Failure of these systems provide significant safety risks as well as high costs to utilities and their customers. Utilities are seeking a way to prioritize the evaluation and possible replacement of their systems to ensure safety and reliability. The objective of this project is to utilize conductor condition data, collected from robotic field inspections and the laboratory evaluations, to develop predictive models of anticipated conductor life based on environmental conditions and conductor characteristics.
Transmission Line Conductor and Shield Wire Performance Analysis	Understand conductor and shield wire.
Unified Grid Control Platform (UGCP) Laboratory Demonstration Project – Phase II	This project will rigorously test the proposed hardware, software, and virtualization technologies and the associated architectures developed through the UGCP Phase I project.

About EPRI

Founded in 1972, EPRI is the world's preeminent independent, non-profit energy research and development organization, with offices around the world. EPRI's trusted experts collaborate with more than 450 companies in 45 countries, driving innovation to ensure the public has clean, safe, reliable, affordable, and equitable access to electricity across the globe. Together, we are shaping the future of energy.

For more information, contact:

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